NANO830/831

Intel® Atom™ D2550/N2600 Processor Nano-ITX Board

User's Manual

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.

- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.

- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Chapter 1
Introduction



NANO830



NANO831

The NANO830/831, a Nano-ITX board, supports Intel® Atom™ D2550/N2600 processors. The board integrates the Intel® NM10 chipset and delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

There is one 204-pin unbuffered SO-DIMM socket for single channel DDR3-800/1066MHz memory, maximum memory capacity up to 4GB (N2600 supports DDR3-800 up to 2GB only). It also features two Gigabit/Fast Ethernet ports, one serial ATA channels for total one Serial ATA hard drive at maximum transfer rate up to 300MB/sec, six USB 2.0 high speed compliant, and built-in HD audio codec that can achieve the best stability and reliability for industrial applications. Additionally, it provides you with unique embedded features, such as two serial ports and Nano-ITX form factor that applies an extensive array of PC peripherals.

1.1 Features

- Intel® Atom™ dual core D2550 (1.86GHz) and N2600 (1.6GHz)
- Intel® NM10 chipset
- 1 DDR3 SO-DIMM supports up to 4GB memory capacity
- 6 USB 2.0 ports
- 2 COM ports
- Supports CFast™

1.2 Specifications

- **CPU**
  - Intel® Atom™ dual core D2550 1.86GHz.
  - Intel® Atom™ dual core N2600 1.6GHz
- **Thermal Solution**
  - With Atom™ dual core D2550 1.86GHz as fan solution.
  - With Atom™ dual core N2600 1.6GHz as fanless solution
- **System Chipset**
  - Intel® NM10 chipset.
- **BIOS**
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
  - 16Mbit SPI Flash, DMI, Plug and Play.
  - RPL/PXE Ethernet Boot ROM.
- **System Memory**
  - One 204-pin unbuffered DDR3 SO-DIMM socket.
  - Maximum up to 4GB DDR3 1066MHz memory for D2550.
  - Maximum up to 2GB DDR3 800MHz memory for N2600.
- **Onboard Multi I/O**
  - Controller: Nuvoton NCT6627UD.
  - Serial Ports: One port for RS-232/422/485 and one port for RS-232.
- **Serial ATA**
  - One SATA-300 connector.
- **CFast™ Socket**
  - One CFast™ socket.
- **USB Interface**
  - Six USB ports with fuse protection and complies with USB Spec. Rev. 2.0.
- **Display**
  - A high rise 15-pin D-Sub connector as VGA connector.
  - One 40-pin connector for 18/24-bit single/dual channel LVDS and one 8-pin inverter connector. For N2600, LVDS resolution is up to 1600x1200 in 24-bit dual channel. For D2550, LVDS resolution is up to 1920x1200 in 24-bit dual channel.
  - One DisplayPort (NANO830 only).

- **Trusted Platform Module (TPM)**
  - Controller: Infineon SLB9635 via LPC bus interface.
  - Complies with TPM1.2 main and PC client specification.

- **Watchdog Timer**
  - 1~255 seconds or minutes; up to 255 levels.

- **Ethernet**
  - Two ports with Intel® 82583V for Gigabit/Fast Ethernet.

- **Audio**
  - HD audio compliant with Realtek ALC662.
  - Line-out and MIC-in audio jack.

- **Expansion Interface**
  - One PCI-Express Mini Card socket which complies with PCI-Express Mini Card Spec. V1.2.

- **Power Input**
  - DC power jack connector co-layout with 2x2 pin connector and 1x2 pin right angle connector
  - +12V DC-in only
  - AT auto power on function supported

- **Power Management**
  - ACPI (Advanced Configuration and Power Interface).

- **Form Factor**
  - Nano-ITX form factor.

***Note*: All specifications and images are subject to change without notice.**

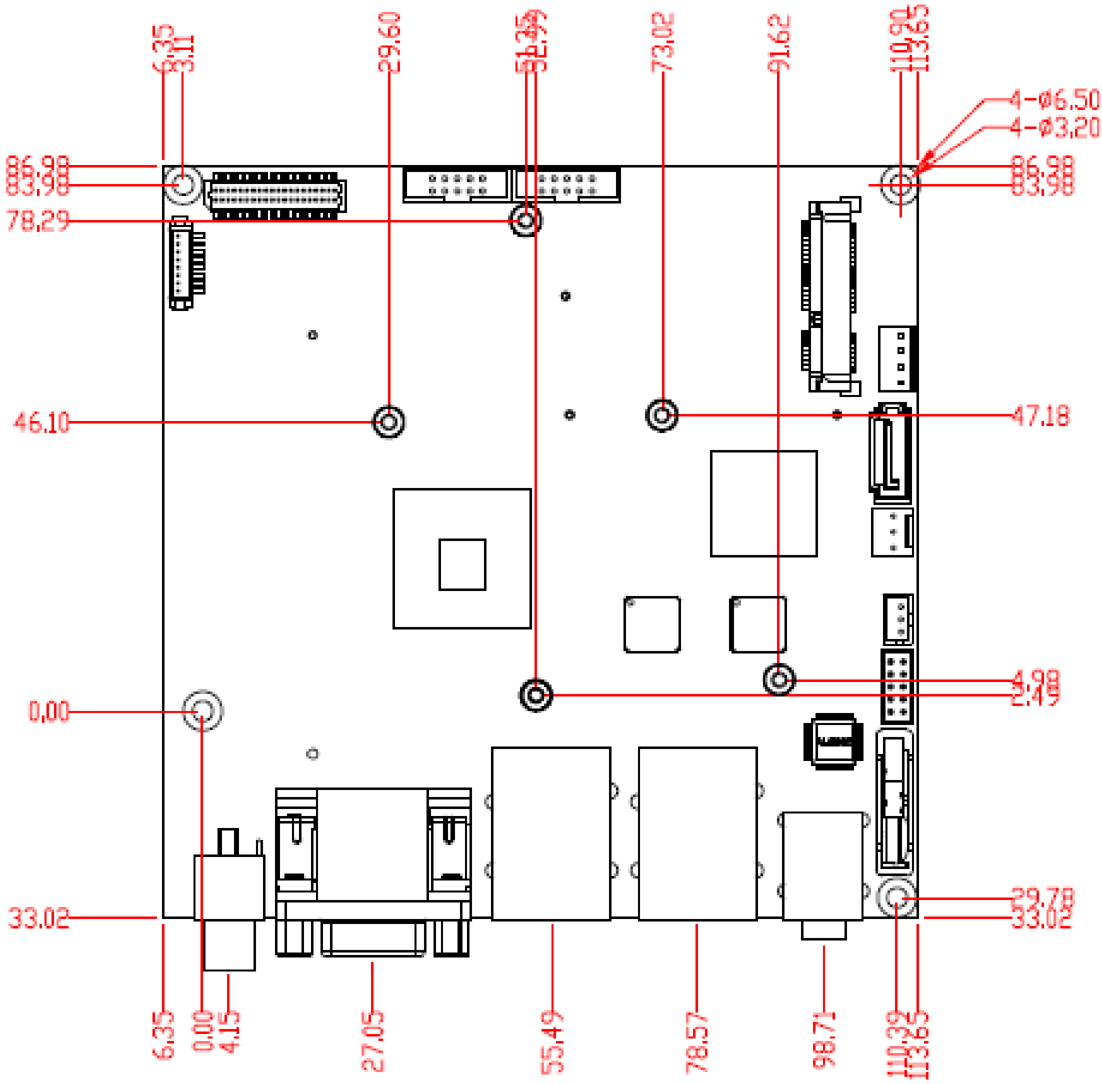
1.3 Utilities Supported

- Chipset and graphics driver
- Ethernet driver (82583V)
- Audio driver
- TPM utility
- Unify API for hardware monitor, digital I/O and watchdog timer

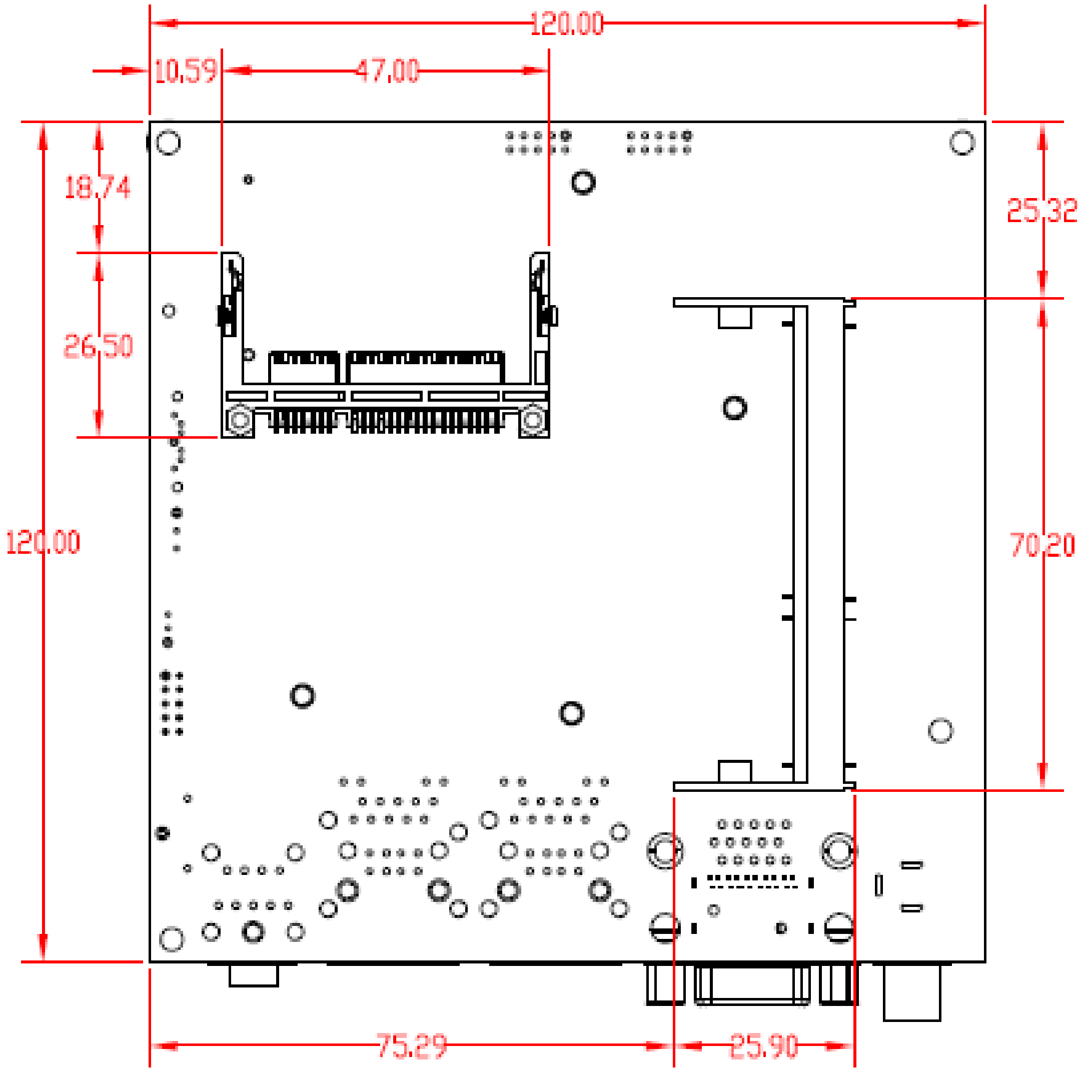
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Chapter 2
Board and Pin Assignments

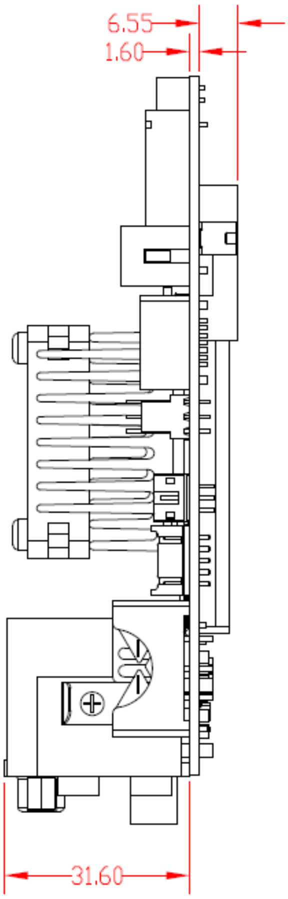
2.1 Board Dimensions and Fixing Holes



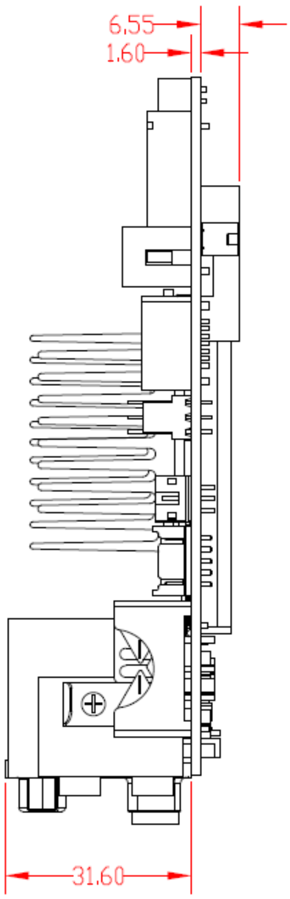
Top View



Bottom View



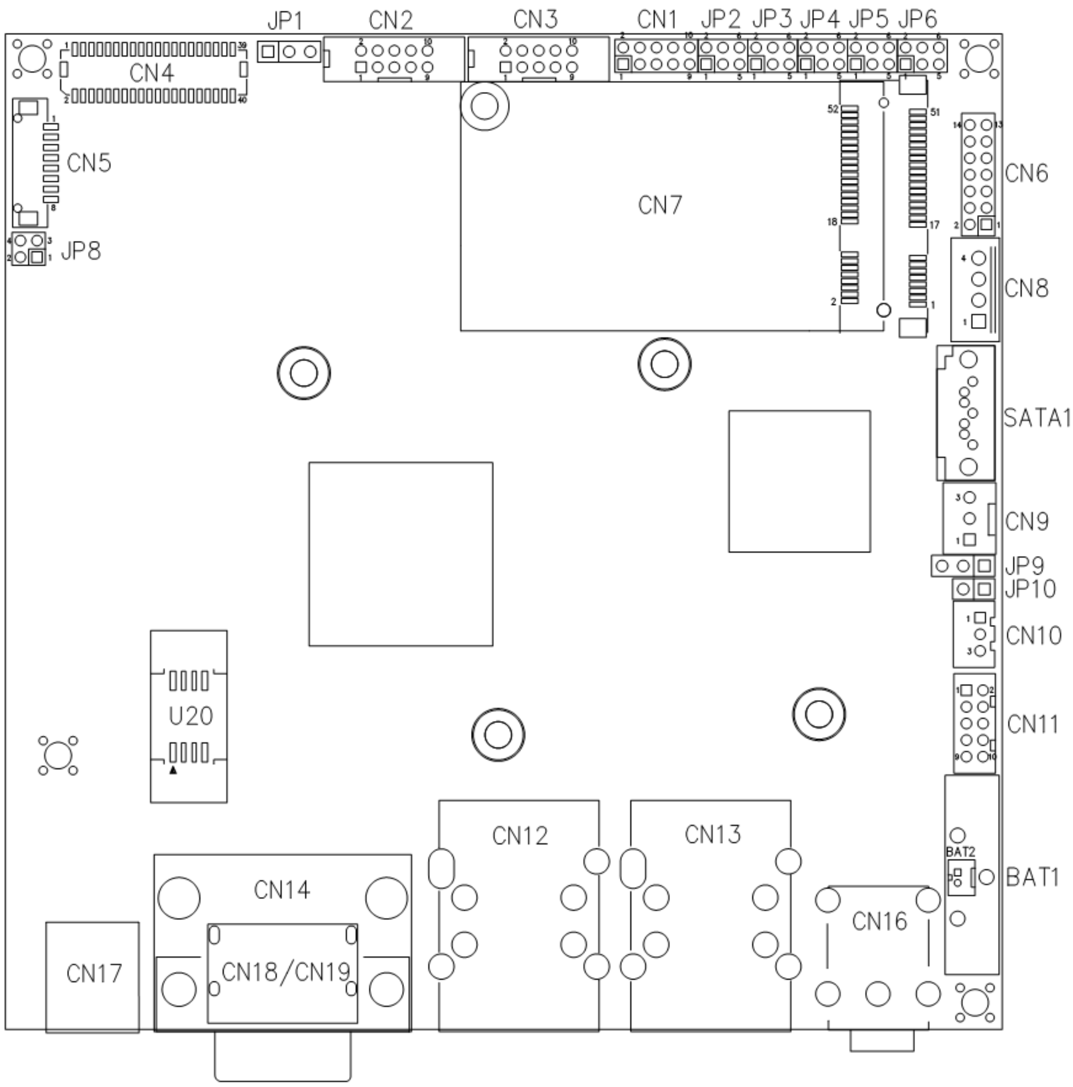
NANO830



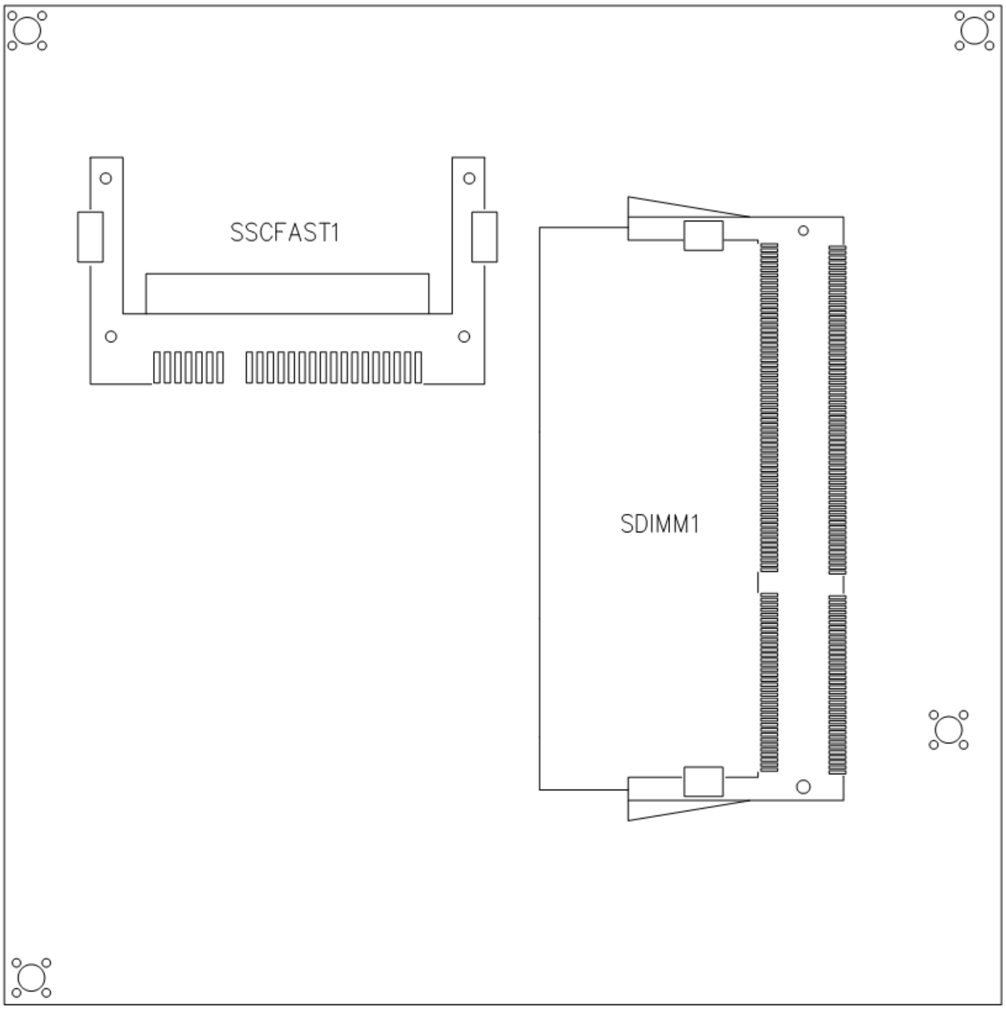
NANO831

Side View

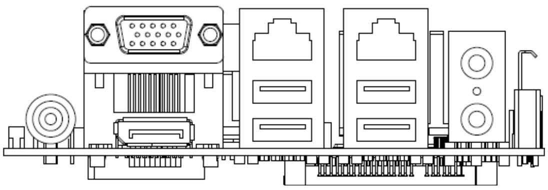
2.2 Board Layout



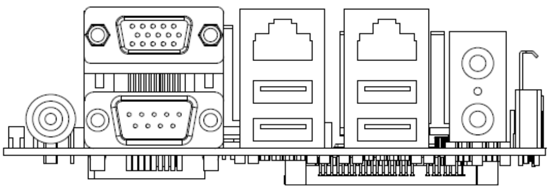
Top View



Bottom View



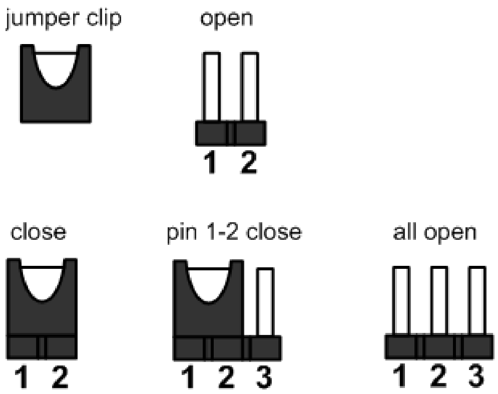
NANO830 – Side View



NANO831 – Side View

2.3 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. Below illustration shows how to set up jumper.



Properly configure jumper settings on the NANO830/831 to meet your application purpose. Below you can find a summary table of all jumpers and onboard default settings.

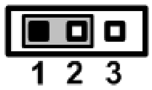
<u>Note</u>: Once the default jumper setting needs to be changed, please do it under power-off condition.

Jumper	Description		Setting
JP1	LVDS Voltage Selection Default: +3.3V level		1-2 Close
JP2	COM1 RS-232/422/485 Mode Setting Default: RS-232		3-5, 4-6 Close
JP3			3-5, 4-6 Close
JP4			1-2 Close
JP5	COM2 Data/Power Selection (NANO830 only) Default: RS-232 Data	CN2 Pin 1: DCD	3-5 Close
		CN2 Pin 8: RI	4-6 Close
	COM2 Data/Power Selection (NANO831 only) Default: RS-232 Data	CN19 Pin 1: DCD	3-5 Close
		CN19 Pin 9: RI	4-6 Close
JP6	COM1 Data/Power Selection Default: RS-232 Data	CN3 Pin 1: DCD	3-5 Close
		CN3 Pin 8: RI	4-6 Close
JP8	LVDS Brightness Control Mode Setting Default: PWM Mode		1-2 Close
JP9	Restore BIOS Optimal Defaults Default: Normal Operation		1-2 Close
JP10	Auto Power On Default: Disable		Close

2.3.1 LVDS Voltage Selection (JP1)

The board supports voltage selection for flat panel displays. Use JP1 to set LVDS connector (CN4) pin 1~6 VCCM to +3.3V or +5V voltage level.

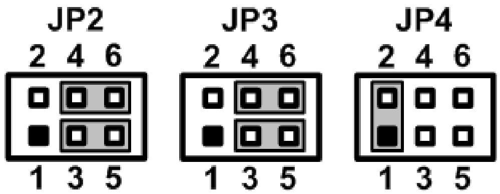
Function	Setting
+3.3V level (Default)	1-2 close
+5V level	2-3 close



2.3.2 COM1 RS-232/422/485 Mode Setting (JP2, JP3, JP4)

Use these jumpers to set COM1 port to operate as RS-232, RS-422 or RS-485 communication mode. When these jumpers are set to operate as RS-422 or RS485, please make sure COM1 is on data mode (see section 2.3.4)

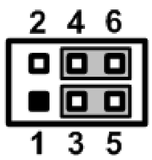
Function	Setting
RS-232 mode (Default)	JP2 3-5, 4-6 close JP3 3-5, 4-6 close JP4 1-2 close
RS-422 mode	JP2 1-3, 2-4 close JP3 1-3, 2-4 close JP4 3-4 close
RS-485 mode	JP2 1-3, 2-4 close JP3 1-3, 2-4 close JP4 5-6 close



2.3.3 COM2 Data/Power Selection (JP5)

The COM2 port has +5V level power capability on DCD and +12V level on RI by setting this jumper.

Function	Setting
Power: Set CN2 pin 1/CN19 pin 1 to +5V level	1-3 close
Data: Set CN2 pin 1/CN19 pin 1 to DCD (Default)	3-5 close
Power: Set CN2 pin 8/CN19 pin 9 to +12V level	2-4 close
Data: Set CN2 pin 8/ CN19 pin 9 to RI (Default)	4-6 close

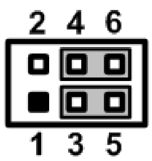


Note: ***The CN2 is a connector on NANO830 while CN19 is a connector on NANO831.***

2.3.4 COM1 Data/Power Selection (JP6)

The COM1 port has +5V level power capability on DCD and +12V level on RI by setting this jumper. When this port is set to +5V or +12V level, please make sure its communication mode is RS-232 (see section 2.3.2).

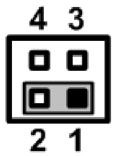
Function	Setting
Power: Set CN3 pin 1 to +5V level	1-3 close
Data: Set CN3 pin 1 to DCD (Default)	3-5 close
Power: Set CN3 pin 8 to +12V level	2-4 close
Data: Set CN3 pin 8 to RI (Default)	4-6 close



2.3.5 LVDS Brightness Control Mode Setting (JP8)

The JP8 enables you to select PWM or voltage control mode for inverter connector (CN5). These two control modes are for adjusting the brightness of LVDS panel.

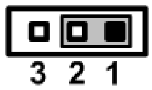
Function	Setting
PWM mode (Default)	1-2 close
Voltage mode	3-4 close



2.3.6 Restore BIOS Optimal Defaults (JP9)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

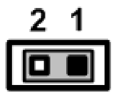
Function	Setting
Normal (Default)	1-2 close
Restore BIOS optimal defaults	2-3 close



2.3.7 Auto Power On (JP10)

If JP10 is enabled for AC power input, the system will be automatically power on without pressing soft power button. If JP10 is disabled for AC power input, it is necessary to manually press soft power button to power on the system.

Function	Setting
Disable auto power on (Default)	Close
Enable auto power on	Open



2.4 Connectors

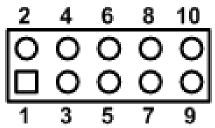
Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN1	Digital I/O Port
CN2	COM2 Connector (NANO830 only)
CN3	COM1 Connector
CN4	LVDS Connector
CN5	Inverter Connector
CN6	Front Panel Connector
CN7	PCI-Express Mini Card Connector
CN8	Power Output Connector
CN9	CPU Fan Connector
CN10	SMBus Connector
CN11	USB Port 4 and 5 Connector
CN12	Ethernet Port 1, USB Port 0 and 1 Stack
CN13	Ethernet Port 2, USB Port 2 and 3 Stack
CN14	VGA Connector
CN16	Audio Jack
CN17	DC Jack Power Connector
CN18	DisplayPort Connector (NANO830 only)
CN19	COM2 Connector (NANO831 only)
SATA1	Serial ATA Connector
SSCFAST1	CFast™ Socket
SDIMM1	DDR3 SO-DIMM Connector

2.4.1 Digital I/O Port (CN1)

The board is equipped with an 8-channel (3 inputs and 5 outputs) digital I/O connector that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals. The software application method is provided in Appendix B.

Pin	Signal	Pin	Signal
1	DI0	2	DO0
3	DI1	4	DO1
5	DI2	6	DO2
7	GND	8	DO3
9	GND	10	DO4



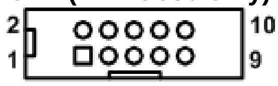


2.4.2 COM2 Connector (CN2 or CN19)

The CN2 is a 2x5-pin box header (NANO830 only). This COM2 port has +5V level power capability on DCD and +12V level on RI by setting JP5 (see section 2.3.3). The pin assignments of RS-232 are listed in table below.

Pin	Signal	Pin	Signal
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	N.C.

CN2 (NANO830 only)

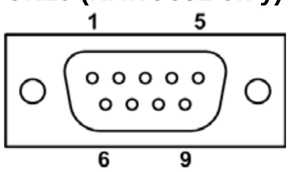


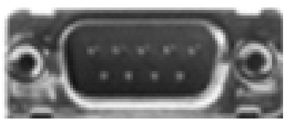


The CN19 is a standard 9-pin D-Sub connector on the rear IO (NANO831 only). This connector is equipped with +5V level power capability on DCD and +12V level on RI by setting JP5 (see section 2.3.3). The pin assignments of RS-232 are listed in table below.

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

CN19 (NANO831 only)

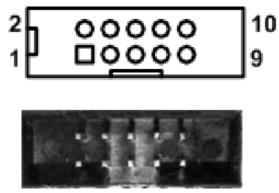




2.4.3 COM1 Connector (CN3)

The CN3 is a 2x5-pin box header. This COM1 port has +5V level power capability on DCD and +12V level on RI by setting JP6 (see section 2.3.4). The pin assignments of RS-232/RS-422/RS-485 are listed in table below. If you need COM1 port to support RS-422 or RS-485, please refer to section 2.3.2.

Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	DSR	No use	No use
3	RXD	TX+	Data+
4	RTS	No use	No use
5	TXD	RX+	No use
6	CTS	No use	No use
7	DTR	RX-	No use
8	RI	No use	No use
9	GND	No use	No use
10	No use	No use	No use

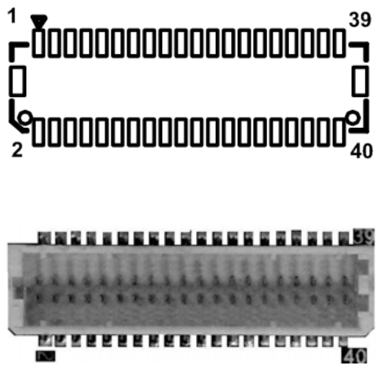


2.4.4 LVDS Connector (CN4)

This board has a 40-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B 40-pin connector for LVDS interface. Pin 1~6 VCCM can be set to +3.3V level or +5V level by setting JP1 (see section 2.3.1).

18-bit single channel

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	GND	16	GND
17	N.C.	18	N.C.
19	N.C.	20	N.C.
21	GND	22	GND
23	Channel A D0-	24	N.C.
25	Channel A D0+	26	N.C.
27	GND	28	GND
29	Channel A D1-	30	N.C.
31	Channel A D1+	32	N.C.
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND



24-bit single channel

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	GND	16	GND
17	N.C.	18	N.C.
19	N.C.	20	N.C.
21	GND	22	GND
23	Channel A D0-	24	N.C.
25	Channel A D0+	26	N.C.
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

18-bit dual channel

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	N.C.	12	Channel B D0-
13	N.C.	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	N.C.
31	Channel A D1+	32	N.C.
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

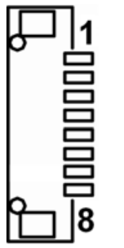
24-bit dual channel

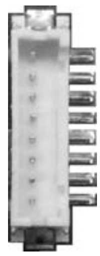
Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	Channel B D3-	12	Channel B D0-
13	Channel B D3+	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

2.4.5 Inverter Connector (CN5)

The CN5 is an 8-pin connector for inverter. We strongly recommend you to use the matching DF13-8S-1.25C connector to avoid malfunction. If the LVDS brightness control is set to voltage control mode (see section 2.3.5), the valid voltage range on pin 8 is 0~5V.

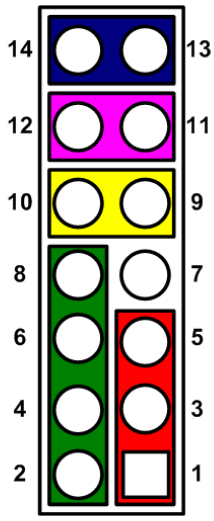
Pin	Signal
1	VBL1 (+12V level)
2	VBL1 (+12V level)
3	VBL2 (+5V level)
4	VBL_ENABLE
5	GND
6	GND
7	GND
8	VBL Brightness Control





2.4.6 Front Panel Connector (CN6)

Pin	Signal
1	PWRLED+
2	EXT SPK-
3	N.C.
4	Buzzer
5	PWRLED-
6	N.C.
7	N.C.
8	EXT SPK+
9	PWRSW-
10	PWRSW+
11	HW RST-
12	HW RST+
13	HDDLED-
14	HDDLED+





Power LED

Pin 1 connects anode(+) of LED and pin 5 connects cathode(-) of LED. The power LED lights up when the system is powered on.

External Speaker and Internal Buzzer

Pin 2, 4, 6 and 8 connect the case-mounted speaker unit or internal buzzer. While connecting the CPU board to an internal buzzer, please set pin 2 and 4 closed; while connecting to an external speaker, you need to set pins 2 and 4 opened and connect the speaker cable to pin 8(+) and pin 2(-).

Power On/Off Button

Pin 9 and 10 connect the power button on front panel to the CPU board, which allows users to turn on or off power supply.

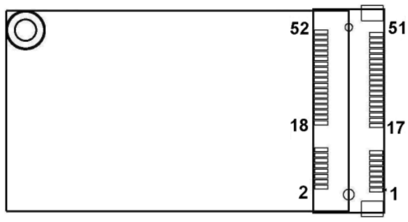
System Reset Switch
Pin 11 and 12 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

HDD Activity LED
This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, pin 13 is assigned as cathode(-) and pin 14 is assigned as anode(+).

2.4.7 PCI-Express Mini Card Connector (CN7)

This is a PCI-Express Mini Card connector that supports PCI-Express x1 link and USB 2.0 link. A PCI-Express Mini Card can be applied to either PCI-Express or USB 2.0. It complies with PCI-Express Mini Card Spec. V1.2.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN3	24	+3.3VSB
25	PE_RXP3	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN3	32	SMB_DATA
33	PE_TXP3	34	GND
35	GND	36	USB_D6-
37	GND	38	USB_D6+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB

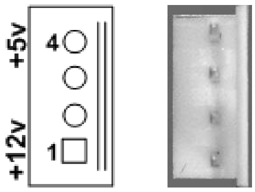




2.4.8 Power Output Connector (CN8)

The CN8 is for interfacing to SATA 2.5" HDD power supply.

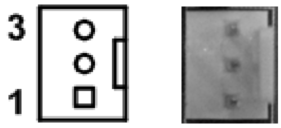
Pin	Signal
1	+12V level
2	GND
3	GND
4	+5V level



2.4.9 CPU Fan Connector (CN9)

A CPU fan interface is available through this connector. You can find fan speed on BIOS Setup Utility if CPU fan is installed. For further information, see BIOS Setup Utility: Advanced\H/W Monitor\PC Health Status (see section 4.4).

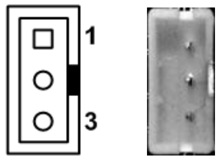
Pin	Signal
1	GND
2	+12V level
3	Fan speed feedback



2.4.10 SMBus Connector (CN10)

This connector is for SMBus interface. The SMBus (System Management Bus) is a simple 2-wire bus for the purpose of lightweight communication.

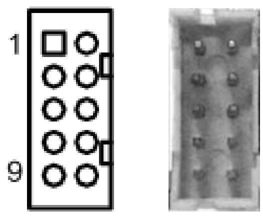
Pin	Signal
1	CLK
2	DATA
3	GND



2.4.11 USB Connector (CN11)

This 2x5-pin wafer is a Universal Serial Bus (USB) connector which carries USB port 4 and USB port 5. It is for installing versatile USB interface peripherals. The CN11 is designed with +5V level standby power which can provide power when system is in suspend mode.

Pin	Signal	Pin	Signal
1	USB VCC (+5V level standby power)	2	USB VCC (+5V level standby power)
3	USB #4_D-	4	USB #5_D-
5	USB #4_D+	6	USB #5_D+
7	GND	8	GND
9	GND	10	GND



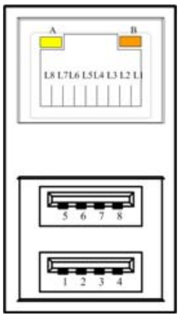
2.4.12 Ethernet and USB Port Stacks (CN12 and CN13)

The board has two RJ-45 connectors. Ethernet connection can be established by plugging one end of the ethernet cable into this RJ-45 connector and the other end (phone jack) to a 1000/100/10-Base-T hub.

The lower Universal Serial Bus (compliant with USB 2.0 (480Mbps)) connector on the rear I/O are for installing USB peripherals such as keyboard, mouse, scanner, etc.

Note that the CN12 carries ethernet port 1, USB port 0 and USB port 1, while the CN13 carries ethernet port 2, USB port 2 and USB port 3.

Pin	LAN Signal	Pin	LAN Signal
L1	MDI0+	L5	MDI2-
L2	MDI0-	L6	MDI1-
L3	MDI1+	L7	MDI3+
L4	MDI2+	L8	MDI3-
A	100 LAN LED (Green) / 1000 LAN LED (Orange)		
B	Active LED (Yellow)		



LAN

USB

Pin	USB Port 0	Pin	USB Port 1
1	USB VCC (+5V level)	5	USB VCC (+5V level)
2	USB #0_D-	6	USB #1_D-
3	USB #0_D+	7	USB #1_D+
4	GND	8	GND

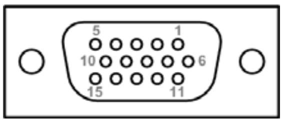


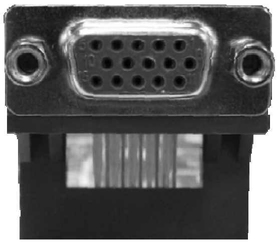
Pin	USB Port 2	Pin	USB Port 3
1	USB VCC (+5V level)	5	USB VCC (+5V level)
2	USB #2_D-	6	USB #3_D-
3	USB #2_D+	7	USB #3_D+
4	GND	8	GND

2.4.13 VGA Connector (CN14)

The CN14 is a high rise 15-pin D-Sub connector which is commonly used for CRT VGA monitor. This VGA interface configuration can be configured via software utility.

Pin	Signal	Pin	Signal
1	Red	2	Green
3	Blue	4	N.C.
5	GND	6	DETECT
7	GND	8	GND
9	VCC	10	GND
11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync
15	DDC CLK		

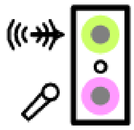
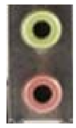




2.4.14 Audio Jack (CN16)

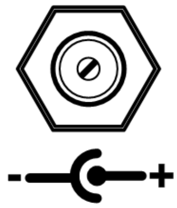
Install onboard audio driver, then connect speaker to line-out jack and microphone to MIC-in jack.

Pin Color	Signal
Green	Line_OUT
Pink	Mic_IN

2.4.15 DC Jack Power Connector (CN17)

The CN17 is a DC power jack with lock. Firmly insert at least 60W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting this power jack.

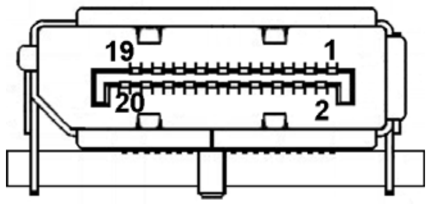


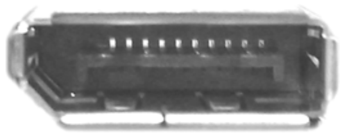
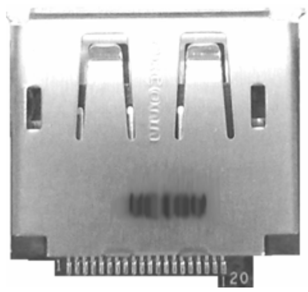


2.4.16 DisplayPort Connector (CN18)

The DisplayPort interface is available through connector CN18 (NANO830 only) which is also co-layout with a standard 9-pin D-Sub connector (CN19).

Pin	Signal
1	DPB_LANE0
2	GND
3	DPB_LANE0#
4	DPB_LANE1
5	GND
6	DPB_LANE1#
7	DPB_LANE2
8	GND
9	DPB_LANE2#
10	DPB_LANE3
11	GND
12	DPB_LANE3#
13	Detect Pin
14	GND
15	DPB_AUX
16	GND
17	DPB_AUX#
18	DPB_HPDE
19	GND
20	+3.3V



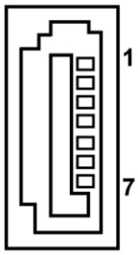



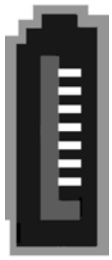
1 20

2.4.17 Serial ATA Connector (SATA1)

This Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for high-speed SATA interface port. It is a computer bus interface for connecting to device such as hard disk drive.

Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

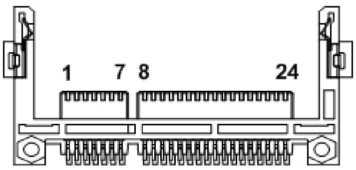


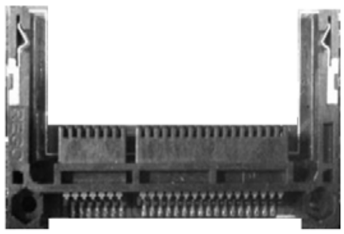


2.4.18 CFast™ Socket (SSCFAST1)

The board is equipped with a CFast™ socket on the bottom side to support a CFast™ card which is based on the Serial ATA bus. The socket is specially designed to avoid incorrect installation of the CFast™ card. When installing or removing the CFast™ card, please make sure the system power is off. The CFast™ card by default identifies itself as C: or D: drive in your PC system.

Pin	Signal	Pin	Signal
1	GND	13	N.C
2	SATA_TX+	14	GND
3	SATA_TX-	15	N.C
4	GND	16	N.C
5	SATA_RX-	17	N.C
6	SATA_RX+	18	N.C
7	GND	19	N.C
8	N.C	20	+3.3V Level
9	GND	21	+3.3V Level
10	N.C	22	GND
11	N.C	23	GND
12	N.C	24	N.C





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Chapter 3
Hardware Description

3.1 Microprocessors

The NANO830/831 supports Intel® Atom™ D2550/N2600 processors, which enable your system to operate under Windows® 7 environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

3.2 BIOS

The NANO830/831 uses AMI Plug and Play BIOS with a single 16Mbit SPI Flash.

3.3 System Memory

The NANO830/831 supports one 204-pin DDR3 SO-DIMM socket for a maximum memory of 4GB DDR3 SDRAMs. The memory module comes in sizes of 1GB, 2GB and 4GB.

3.4 I/O Port Address Map

The Intel® AtomTM D2550/N2600 processors communicate via I/O ports. Total 1KB port addresses are available for assigning to other devices via I/O expansion cards.

Input/output (IO)
- [00000000 - 0000001F] Direct memory access controller
- [00000000 - 00000CF7] PCI bus
- [00000010 - 0000001F] Motherboard resources
- [00000020 - 00000021] Programmable interrupt controller
- [00000022 - 0000003F] Motherboard resources
- [00000024 - 00000025] Programmable interrupt controller
- [00000028 - 00000029] Programmable interrupt controller
- [0000002C - 0000002D] Programmable interrupt controller
- [0000002E - 0000002F] Motherboard resources
- [00000030 - 00000031] Programmable interrupt controller
- [00000034 - 00000035] Programmable interrupt controller
- [00000038 - 00000039] Programmable interrupt controller
- [0000003C - 0000003D] Programmable interrupt controller
- [00000040 - 00000043] System timer
- [00000044 - 0000005F] Motherboard resources
- [0000004E - 0000004F] Motherboard resources
- [00000050 - 00000053] System timer
- [00000061 - 00000061] Motherboard resources
- [00000062 - 00000063] Motherboard resources
- [00000063 - 00000063] Motherboard resources
- [00000065 - 00000065] Motherboard resources
- [00000065 - 0000006F] Motherboard resources
- [00000067 - 00000067] Motherboard resources
- [00000070 - 00000070] Motherboard resources
- [00000070 - 00000077] System CMOS/real time clock
- [00000072 - 0000007F] Motherboard resources
- [00000080 - 00000080] Motherboard resources
- [00000080 - 00000080] Motherboard resources
- [00000081 - 00000091] Direct memory access controller
- [00000084 - 00000086] Motherboard resources
- [00000088 - 00000088] Motherboard resources
- [0000008C - 0000008E] Motherboard resources
- [00000090 - 0000009F] Motherboard resources
- [00000092 - 00000092] Motherboard resources
- [00000093 - 0000009F] Direct memory access controller
- [000000A0 - 000000A1] Programmable interrupt controller
- [000000A2 - 000000BF] Motherboard resources
- [000000A4 - 000000A5] Programmable interrupt controller
- [000000A8 - 000000A9] Programmable interrupt controller
- [000000AC - 000000AD] Programmable interrupt controller
- [000000B0 - 000000B1] Programmable interrupt controller
- [000000B2 - 000000B3] Motherboard resources
- [000000B4 - 000000B5] Programmable interrupt controller
- [000000B8 - 000000B9] Programmable interrupt controller
- [000000BC - 000000BD] Programmable interrupt controller
- [000000C0 - 000000DF] Direct memory access controller
- [000000E0 - 000000EF] Motherboard resources
- [000000F0 - 000000F0] Numeric data processor
- [00000290 - 00000297] Motherboard resources
- [000002F8 - 000002FF] Communications Port (COM2)
- [000003B0 - 000003BB] Intel(R) Graphics Media Accelerator 3600 Series
- [000003C0 - 000003DF] Intel(R) Graphics Media Accelerator 3600 Series
- [000003F8 - 000003FF] Communications Port (COM1)
- [00000400 - 0000047F] Motherboard resources
- [00000400 - 0000047F] Motherboard resources
- [000004D0 - 000004D1] Motherboard resources
- [000004D0 - 000004D1] Programmable interrupt controller
- [00000500 - 0000053F] Motherboard resources
- [00000500 - 0000057F] Motherboard resources

[00000600 - 0000061F] Motherboard resources
[00000680 - 0000069F] Motherboard resources
[000006A0 - 000006AF] Motherboard resources
[000006B0 - 000006EF] Motherboard resources
[00000D00 - 0000FFFF] PCI bus
[00001000 - 0000100F] Motherboard resources
[0000D000 - 0000DFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
[0000E000 - 0000EFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
[0000F000 - 0000F01F] Intel(R) N10/ICH7 Family SMBus Controller - 27DA
[0000F020 - 0000F02F] Standard AHCI 1.0 Serial ATA Controller
[0000F040 - 0000F05F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
[0000F060 - 0000F07F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
[0000F080 - 0000F09F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
[0000F0A0 - 0000F0BF] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
[0000F0C0 - 0000F0C3] Standard AHCI 1.0 Serial ATA Controller
[0000F0D0 - 0000F0D7] Standard AHCI 1.0 Serial ATA Controller
[0000F0E0 - 0000F0E3] Standard AHCI 1.0 Serial ATA Controller
[0000F0F0 - 0000F0F7] Standard AHCI 1.0 Serial ATA Controller
[0000F100 - 0000F107] Intel(R) Graphics Media Accelerator 3600 Series
[0000FFFF - 0000FFFF] Motherboard resources
[0000FFFF - 0000FFFF] Motherboard resources

3.5 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

Interrupt request (IRQ)

IRQ	Device
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000003 (03)	Communications Port (COM2)
(ISA) 0x00000004 (04)	Communications Port (COM1)
(ISA) 0x00000008 (08)	System CMOS/real time clock
(ISA) 0x0000000D (13)	Numeric data processor
(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System

(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System
(ISA) 0x000000AB (171) Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172) Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173) Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174) Microsoft ACPI-Compliant System
(ISA) 0x000000AF (175) Microsoft ACPI-Compliant System
(ISA) 0x000000B0 (176) Microsoft ACPI-Compliant System
(ISA) 0x000000B1 (177) Microsoft ACPI-Compliant System
(ISA) 0x000000B2 (178) Microsoft ACPI-Compliant System
(ISA) 0x000000B3 (179) Microsoft ACPI-Compliant System
(ISA) 0x000000B4 (180) Microsoft ACPI-Compliant System
(ISA) 0x000000B5 (181) Microsoft ACPI-Compliant System
(ISA) 0x000000B6 (182) Microsoft ACPI-Compliant System
(ISA) 0x000000B7 (183) Microsoft ACPI-Compliant System
(ISA) 0x000000B8 (184) Microsoft ACPI-Compliant System
(ISA) 0x000000B9 (185) Microsoft ACPI-Compliant System
(ISA) 0x000000BA (186) Microsoft ACPI-Compliant System
(ISA) 0x000000BB (187) Microsoft ACPI-Compliant System
(ISA) 0x000000BC (188) Microsoft ACPI-Compliant System
(ISA) 0x000000BD (189) Microsoft ACPI-Compliant System

(ISA) 0x000000BE (190) Microsoft ACPI-Compliant System
(PCI) 0x0000000B (11) Intel(R) N10/ICH7 Family SMBus Controller - 27DA
(PCI) 0x00000010 (16) Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
(PCI) 0x00000010 (16) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
(PCI) 0x00000011 (17) Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
(PCI) 0x00000012 (18) Intel(R) N10/ICH7 Family PCI Express Root Port - 27D4
(PCI) 0x00000012 (18) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
(PCI) 0x00000013 (19) Intel(R) N10/ICH7 Family PCI Express Root Port - 27D6
(PCI) 0x00000013 (19) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
(PCI) 0x00000013 (19) Standard AHCI 1.0 Serial ATA Controller
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0x00000017 (23) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
(PCI) 0x00000017 (23) Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
(PCI) 0xFFFFFFFC (-4) Intel(R) 82583V Gigabit Network Connection #2
(PCI) 0xFFFFFFFD (-3) Intel(R) 82583V Gigabit Network Connection
(PCI) 0xFFFFFFFE (-2) Intel(R) Graphics Media Accelerator 3600 Series

3.6 Memory Map

The memory mapping list is shown as follows:

- Memory
  - [00000000 - 00000FFF] Motherboard resources
  - [00000000 - 00000FFF] Motherboard resources
  - [00000000 - 00003FFF] Motherboard resources
  - [000A0000 - 000BFFFF] Intel(R) Graphics Media Accelerator 3600 Series
  - [000A0000 - 000BFFFF] PCI bus
  - [000C0000 - 000DFFFF] PCI bus
  - [000E0000 - 000EFFFF] PCI bus
  - [000F0000 - 000FFFFF] PCI bus
  - [CF800000 - CFFFFFFF] PCI bus
  - [D0000000 - FEBFFFFF] PCI bus
  - [DFC00000 - DFCFFFFF] Intel(R) Graphics Media Accelerator 3600 Series
  - [DFD00000 - DFD1FFFF] Intel(R) 82583V Gigabit Network Connection #2
  - [DFD00000 - DFDFFFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
  - [DFD20000 - DFD23FFF] Intel(R) 82583V Gigabit Network Connection #2
  - [DFE00000 - DFE1FFFF] Intel(R) 82583V Gigabit Network Connection
  - [DFE00000 - DFEFFFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
  - [DFE20000 - DFE23FFF] Intel(R) 82583V Gigabit Network Connection
  - [DFF00000 - DFF03FFF] High Definition Audio Controller
  - [DFF04000 - DFF043FF] Standard AHCI 1.0 Serial ATA Controller
  - [DFF05000 - DFF053FF] Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
  - [E0000000 - EFFFFFFF] System board
  - [FEC00000 - FEC00FFF] Motherboard resources
  - [FED14000 - FED19FFF] System board
  - [FED1C000 - FED1FFFF] Motherboard resources
  - [FED1C000 - FED1FFFF] Motherboard resources
  - [FED20000 - FED8FFFF] Motherboard resources
  - [FED40000 - FED44FFF] Infineon Trusted Platform Module
  - [FED45000 - FED8FFFF] Motherboard resources
  - [FEE00000 - FEE00FFF] Motherboard resources
  - [FF000000 - FFFFFFFF] Intel(R) 82802 Firmware Hub Device
  - [FF000000 - FFFFFFFF] Intel(R) 82802 Firmware Hub Device
  - [FFE00000 - FFFFFFFF] Motherboard resources

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Chapter 4
AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the <Del> key immediately.
2. After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

***Note**: If your computer can not boot after making and saving system changes with Setup, you can restore BIOS optimal defaults by setting JP9 (see section 2.3.6).*

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

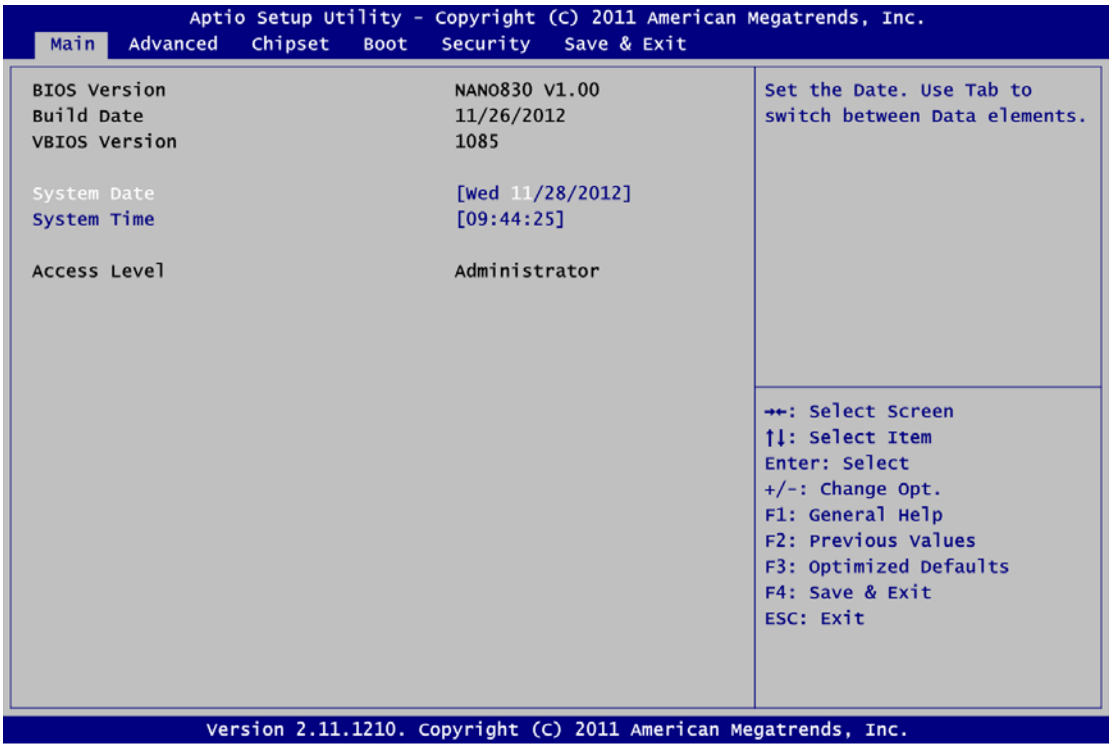
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

***Note**: Some of the navigation keys differ from one screen to another.*

Hot Keys	Description
→← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

4.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.



BIOS Information
Display the auto-detected BIOS information.

System Date/Time
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

4.4 Advanced Menu

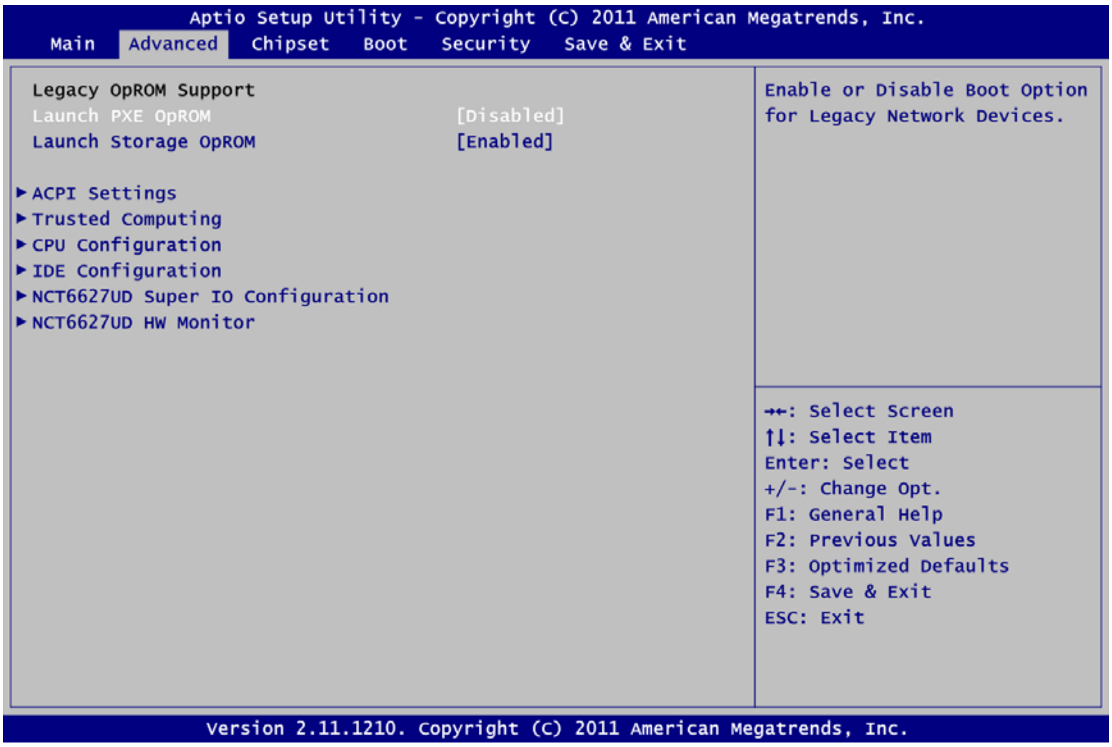
Launch PXE OpROM
Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

Launch Storage OpROM
Enable or disable boot option for legacy mass storage devices with option ROM.

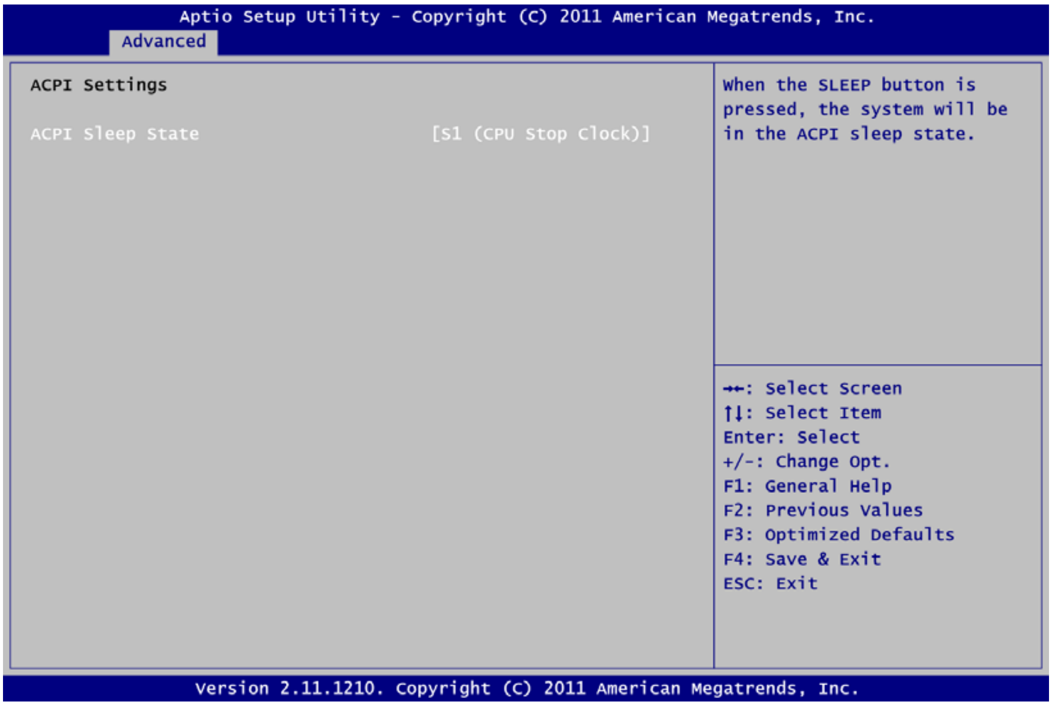
The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- ► ACPI Settings
- ► Trusted Computing
- ► CPU Configuration
- ► IDE Configuration
- ► NCT6627UD Super IO Configuration
- ► NCT6627UD HW Monitor

For items marked with "►", please press <Enter> for more options.



- **ACPI Settings**



ACPI Sleep State
When the sleep button is pressed, the system will be in the ACPI sleep state. The default is S1 (CPU Stop Clock).

- **Trusted Computing**
  This screen provides function for specifying the TPM settings.

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced

Configuration                                    Enables or Disables BIOS
  TPM SUPPORT                  [Disable]         support for security device
                                                 O.S. will not show Security
Current Status Information                       Device. TCG EFI protocol and
  SUPPORT TURNED OFF                             INT1A interface will not be
                                                 available.

                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

TPM Support
Enable or disable BIOS support for security device. “Disable” is the default.

Current Status Information
Display current TPM status information.

- **CPU Configuration**
  This screen shows the CPU Configuration.

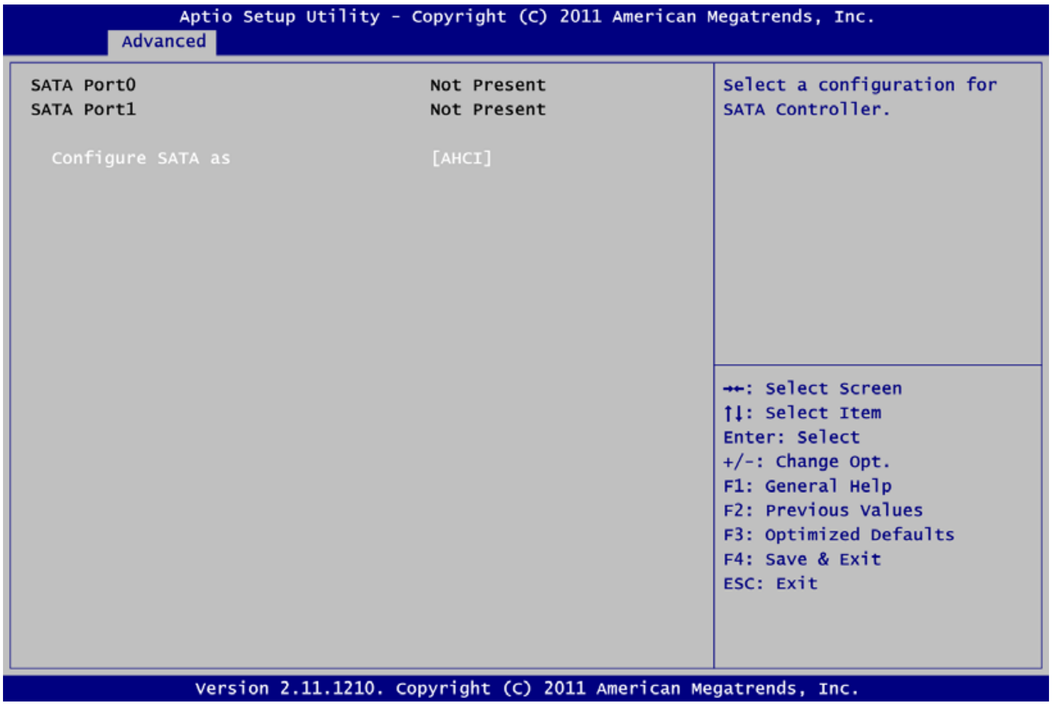
```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced

CPU Configuration

Intel(R) Atom(TM) CPU N2600  @ 1.60GHz
Processor Speed                   1600 MHz
System Bus Speed                  400 MHz
Ratio Status                      16
Actual Ratio                      16
System Bus Speed                  400 MHz
Processor Stepping                30661
Microcode Revision                269
L1 Cache RAM                      2x56 k
L2 Cache RAM                      2x512 k
Processor Core                    Dual
Hyper-Threading                   Supported
                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

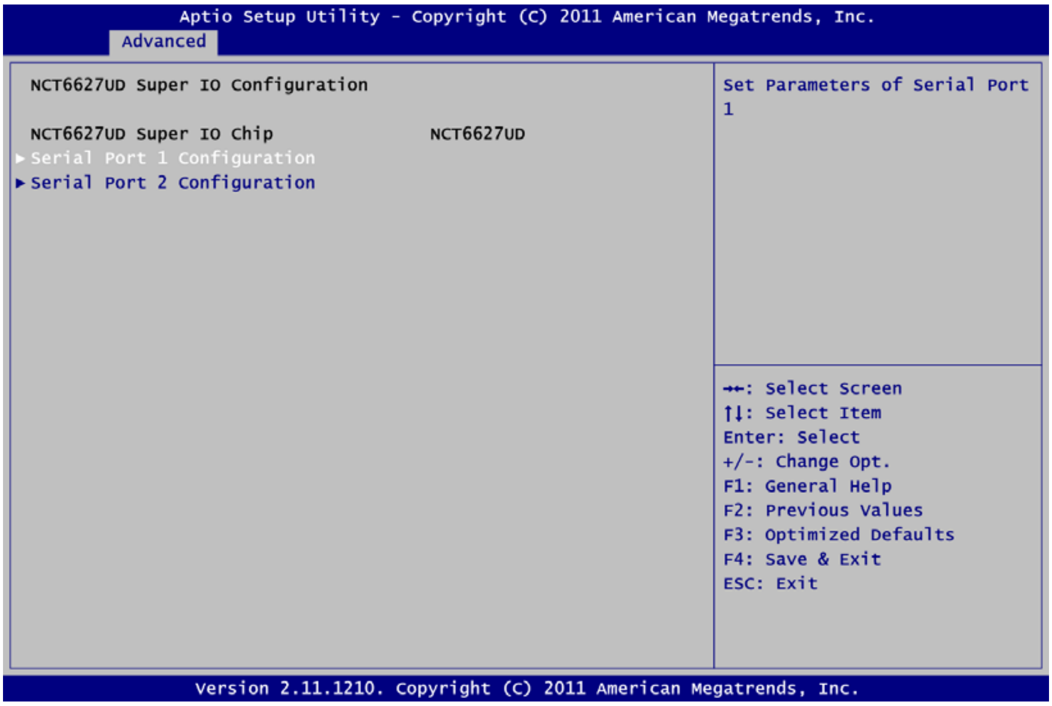
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

- **IDE Configuration**
  In the IDE Configuration menu, you can see the currently installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.



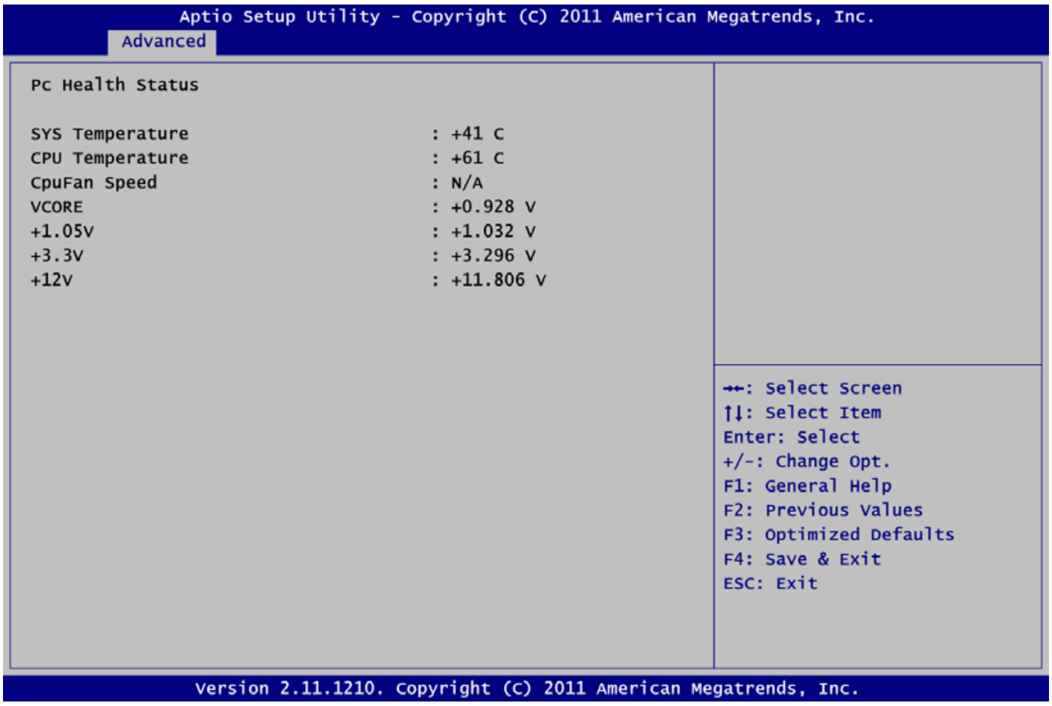
Configure SATA as
Determine how SATA controller(s) operate. Operation mode options are IDE Mode and AHCI (Advanced Host Controller Interface) Mode.

- **NCT6627UD Super IO Configuration**
  You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.



Serial Port 1~2 Configuration
Use these items to enable or disable the serial port 1~2.

- **NCT6627UD HW Monitor**
  This screen monitors hardware health status.



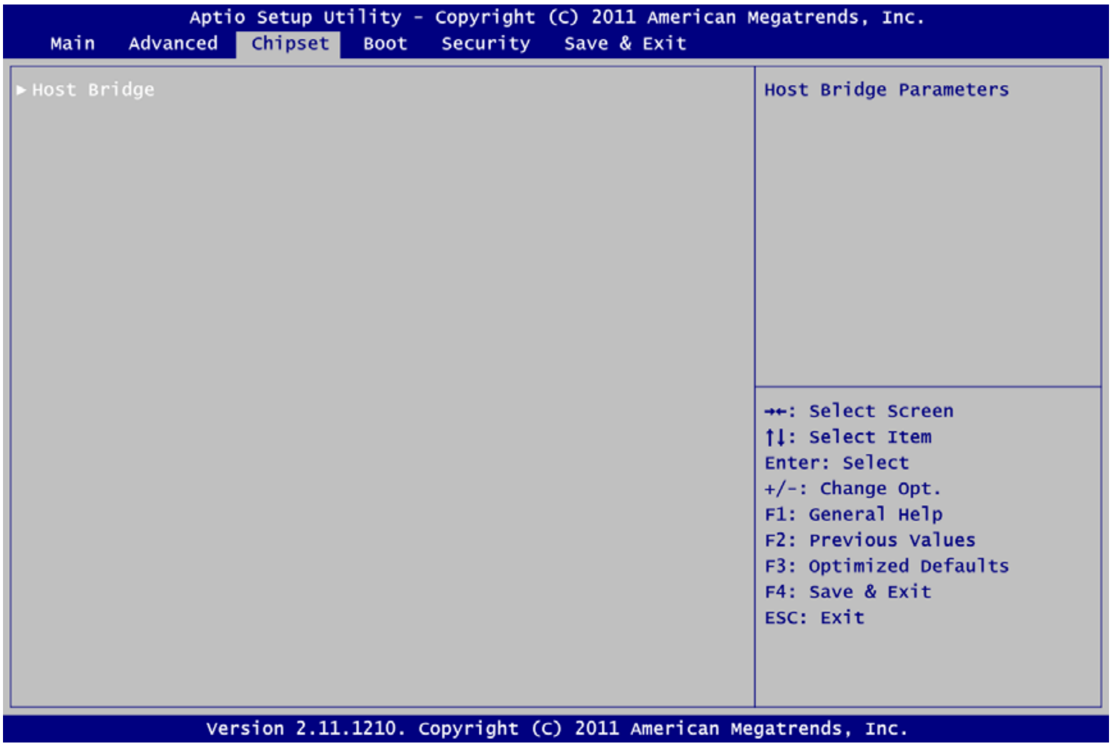
This screen displays the temperature of system and CPU, CPU fan speed in RPM and system voltages (VCORE, +1.05V, +3.3V and +12V).

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

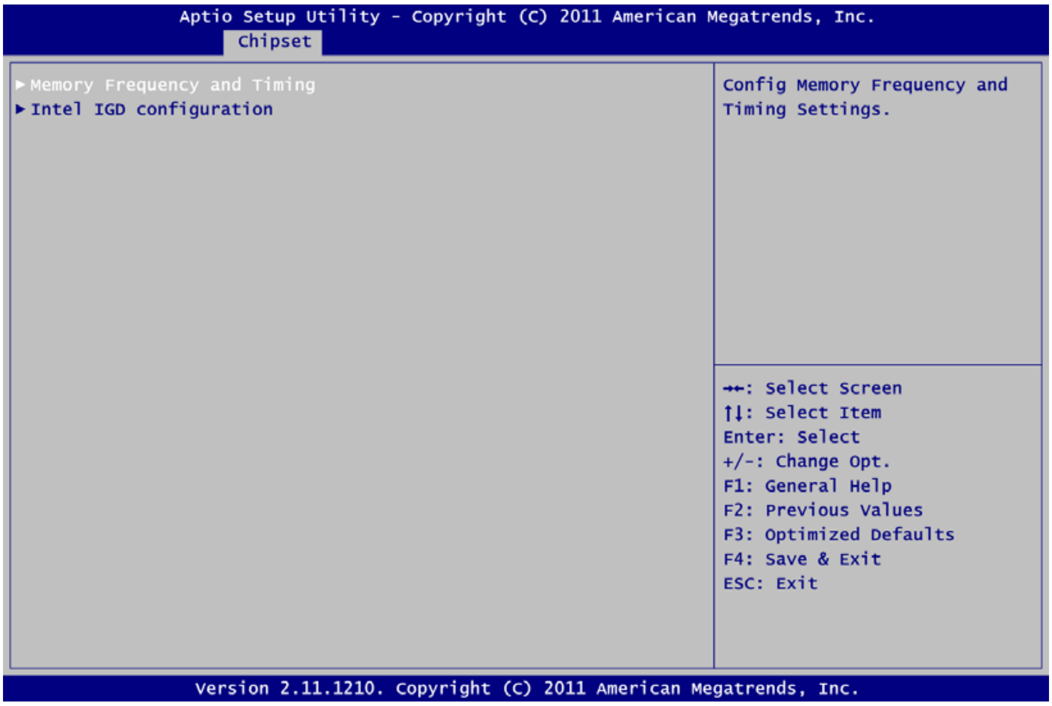
- ► Host Bridge

For items marked with "►", please press <Enter> for more options.



- **Host Bridge**

This screen allows users to configure parameters of Host Bridge chipset.



Memory Frequency and Timing

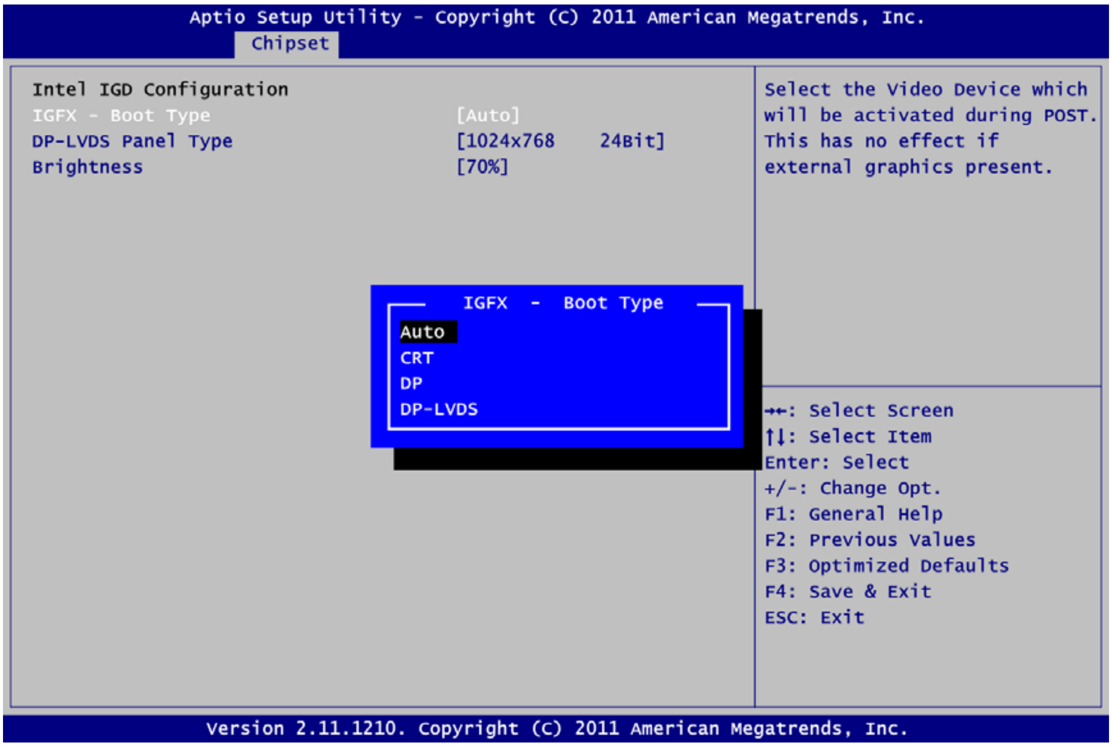
Use this item to refer to the information related to memory frequency.

Intel IGD Configuration

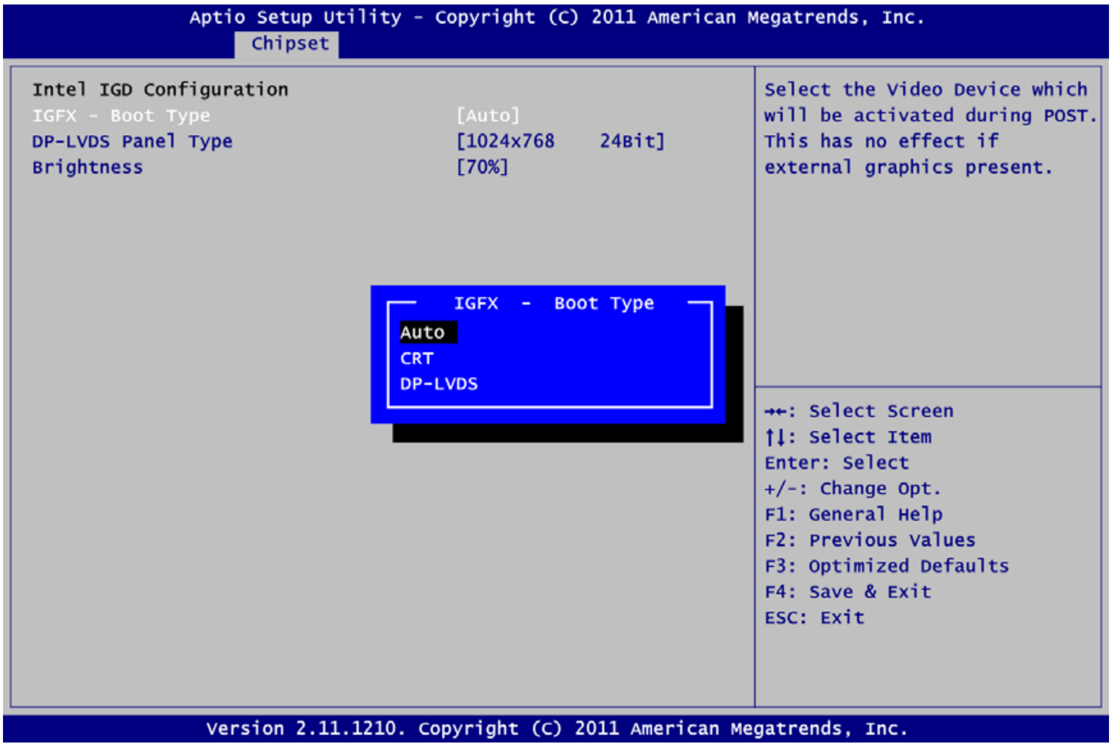
Use this item to configure internal graphics controller.

- **Intel IGD Configuration**

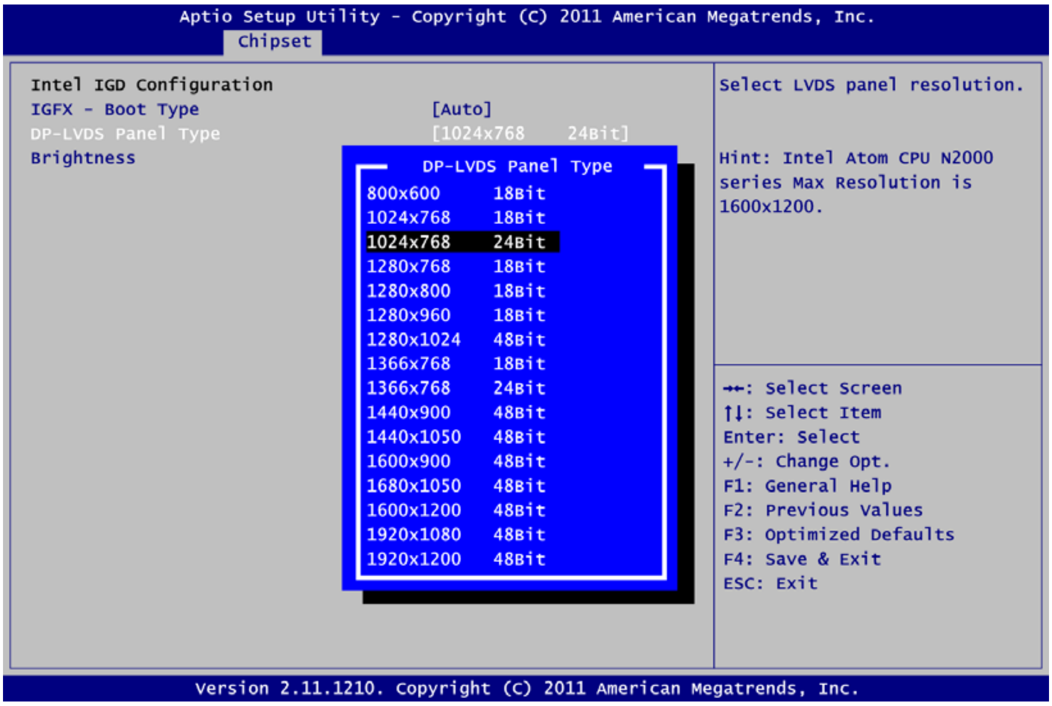
For NANO830:



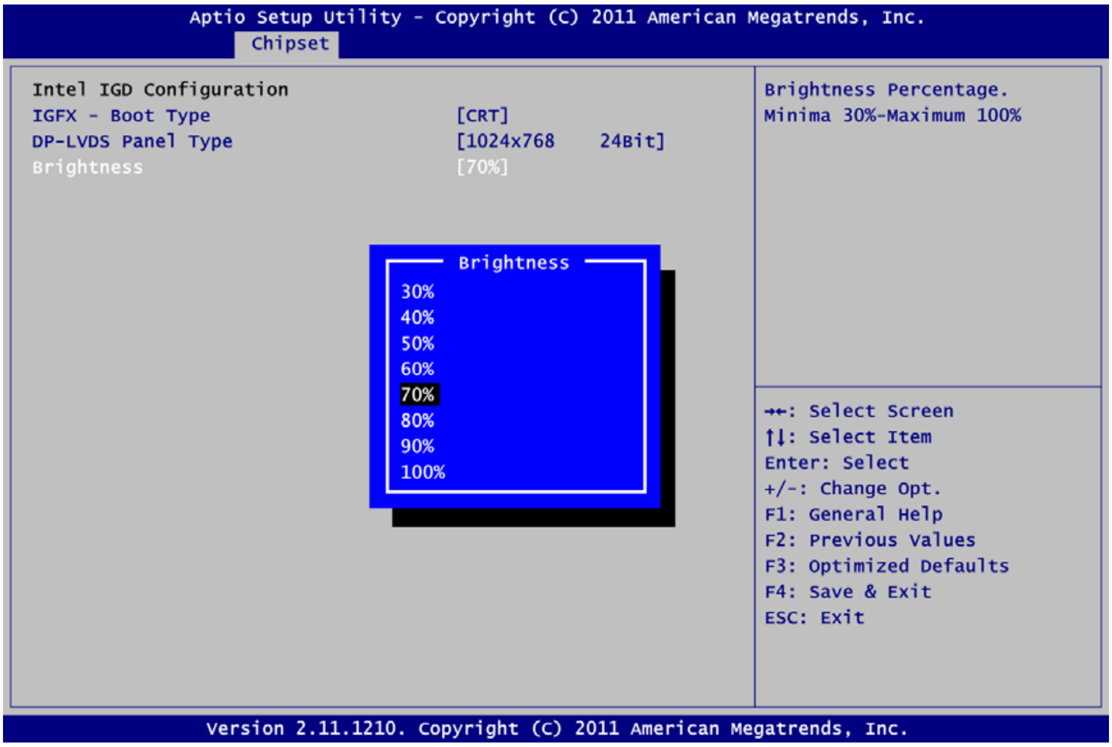
For NANO831:



IGFX – Boot Type
Select the video device which will be activated during POST (Power-On Self Test). This has no effect if external graphics present.



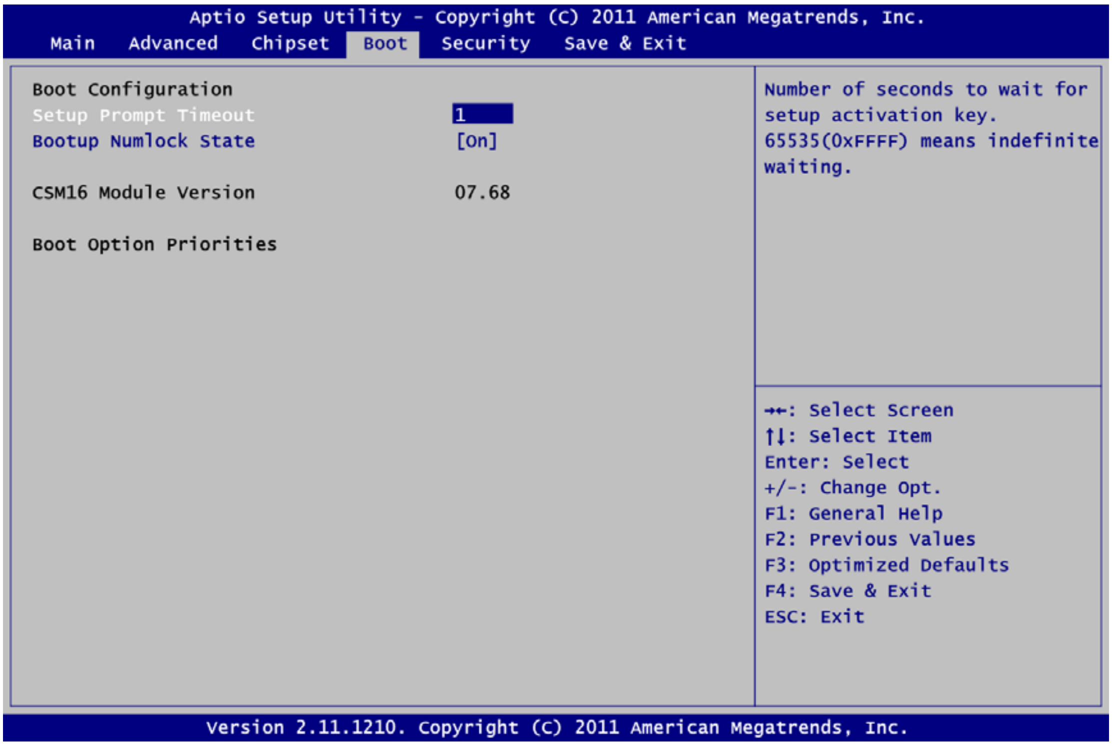
DP-LVDS Panel Type
Select LVDS panel resolution.



Brightness
Use this item to select the brightness percentage of LVDS panel. Its range is from 30% to 100%. The default is 70%.

4.6 Boot Menu

The Boot menu allows users to change boot options of the system.



- **Setup Prompt Timeout**
  Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- **Bootup NumLock State**
  Use this item to select the power-on state for the NumLock.

- **Boot Option Priorities**
  These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.7 Security Menu

The Security menu allows users to change the security settings for the system.

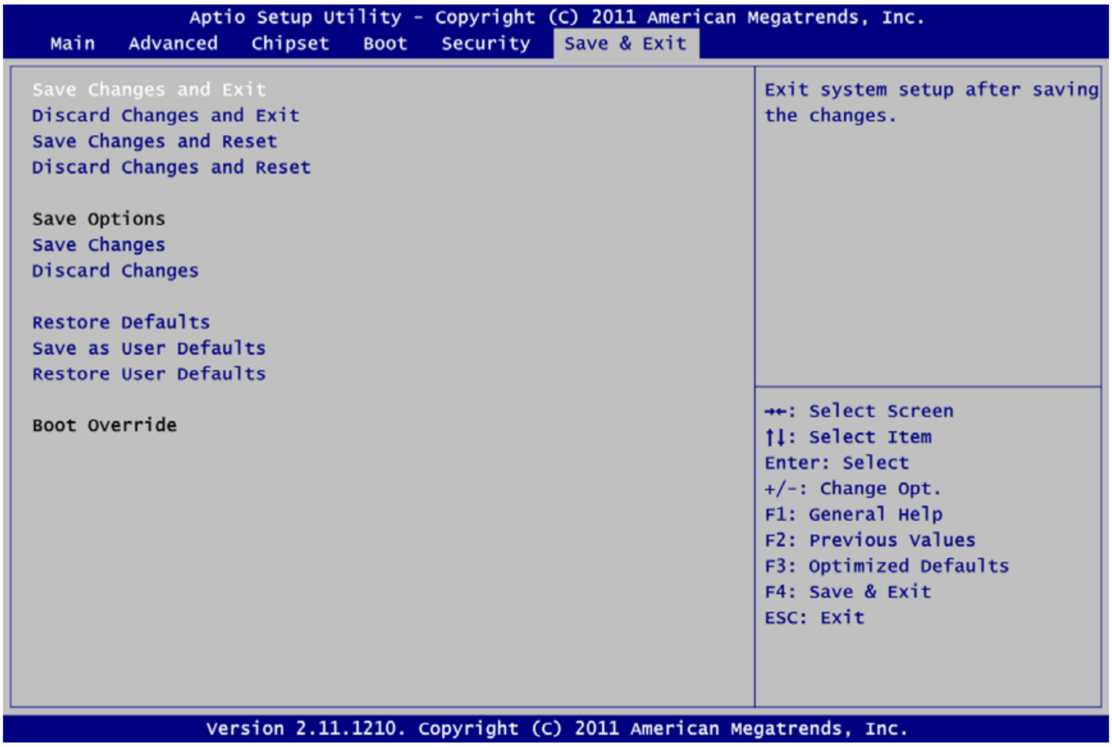


- **Administrator Password**
  This item indicates whether an administrator password has been set (installed or uninstalled).

- **User Password**
  This item indicates whether an user password has been set (installed or uninstalled).

4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.



- **Save Changes and Exit**
  When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

- **Discard Changes and Exit**
  Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

- **Save Changes and Reset**
  When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

- **Discard Changes and Reset**
  Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

- **Save Changes**
  When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- **Discard Changes**
  Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

- **Restore Defaults**
  It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

- **Save as User Defaults**
  Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

- **Restore User Defaults**
  It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

- **Boot Override**
  Select a drive to immediately boot that device regardless of the current boot order.

Chapter 5
Drivers Installation

The device drivers are located on the product information CD that comes with the NANO830/831 Series package. The auto-run function of drivers will guide you to install the utilities and device drivers under Windows system. You can follow the onscreen instructions to install these devices:

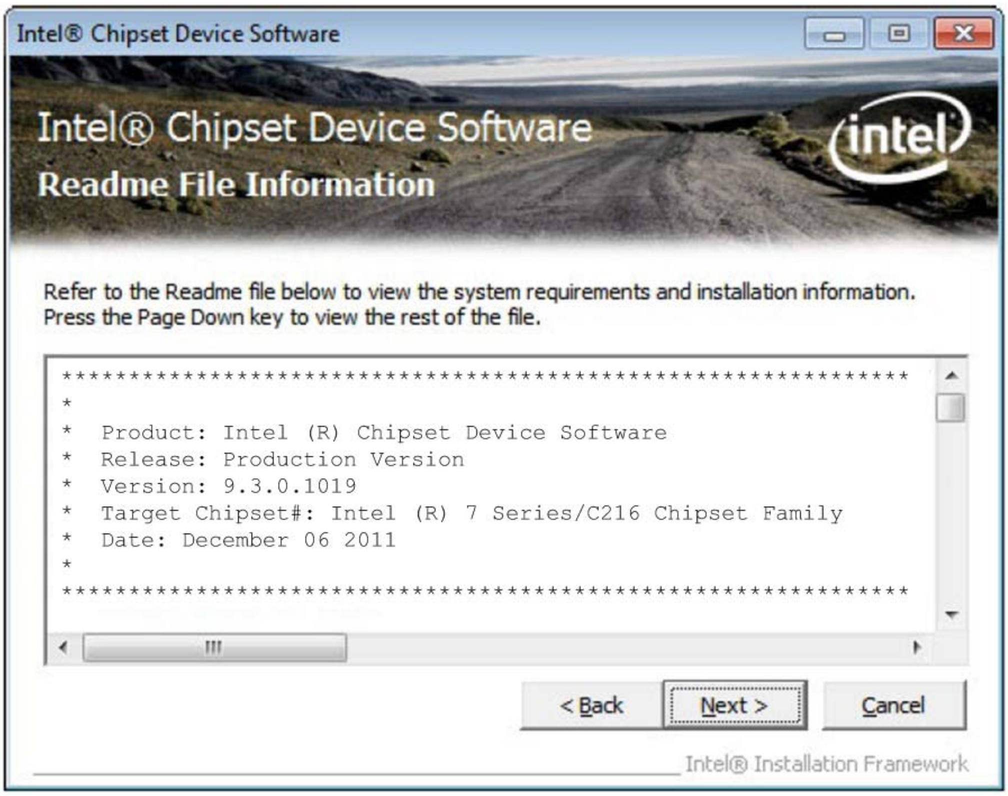
- Chipset
- Graphics
- Ethernet
- Audio

5.1 Installing Chipset Driver

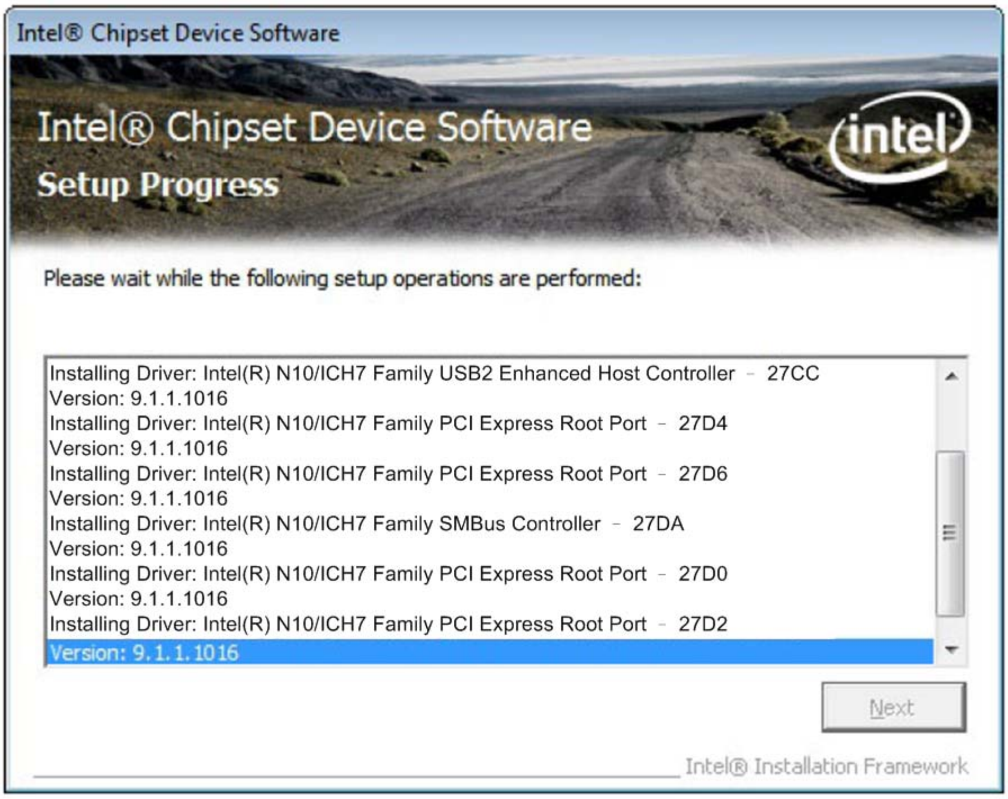
1. Run the infinst_autol.exe program from the driver directory in product information CD. Click “Next” to next step.



2. A Readme File Information screen appears to show you the system requirements and installation information. Click “Next” to next step.



3. Please wait while setup processes the following operations.



4. You are suggested to select “Yes, I want to restart this computer now”. Click “Finish” to complete the setup process and reboot.



5.2 Installing Graphics Media Accelerator Driver

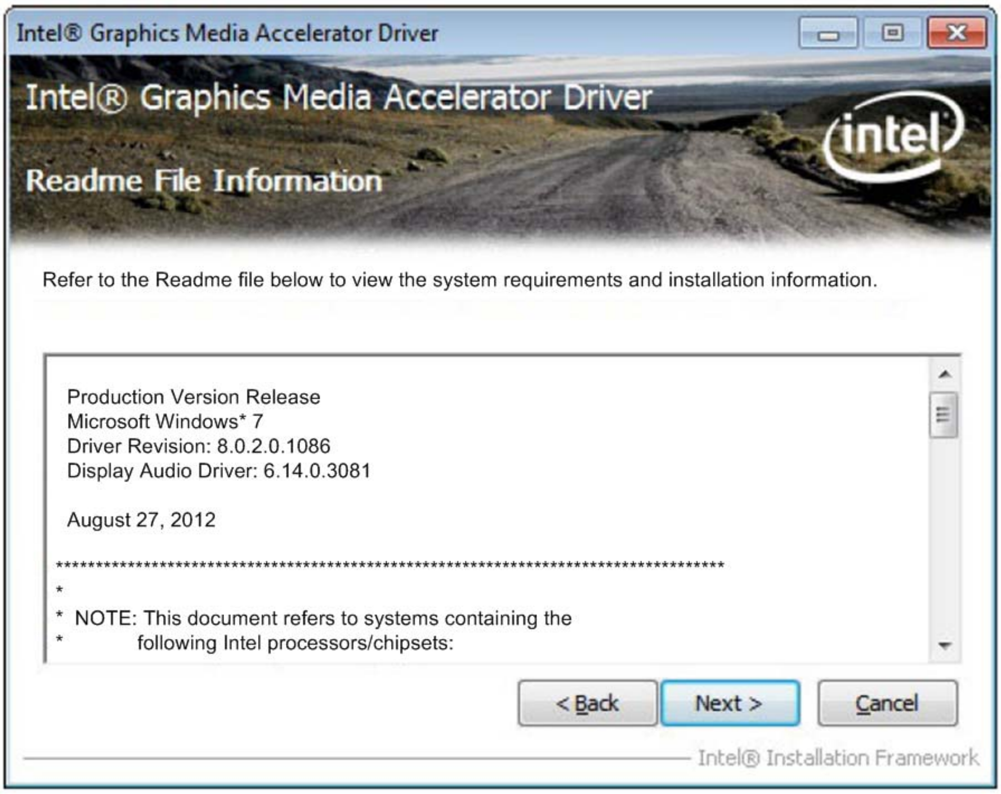
1. Run the setup.exe program from the driver directory in product information CD. Click "Next" to next step.



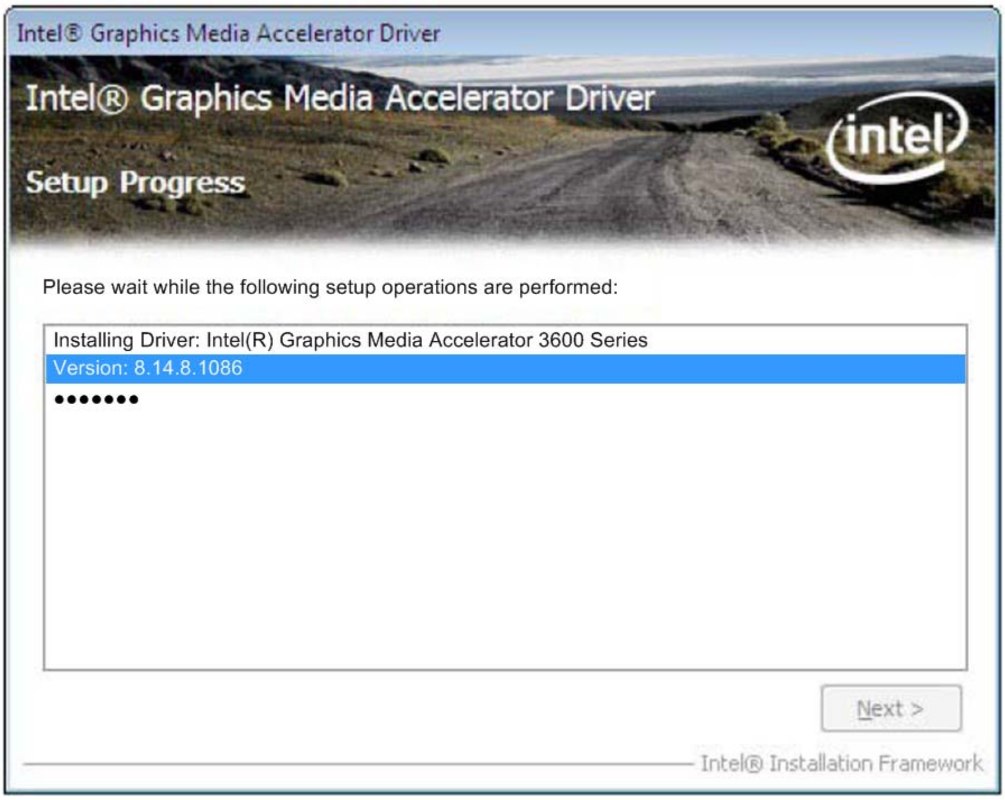
2. When Intel® License Agreement screen appears, please click "Yes" to next step.



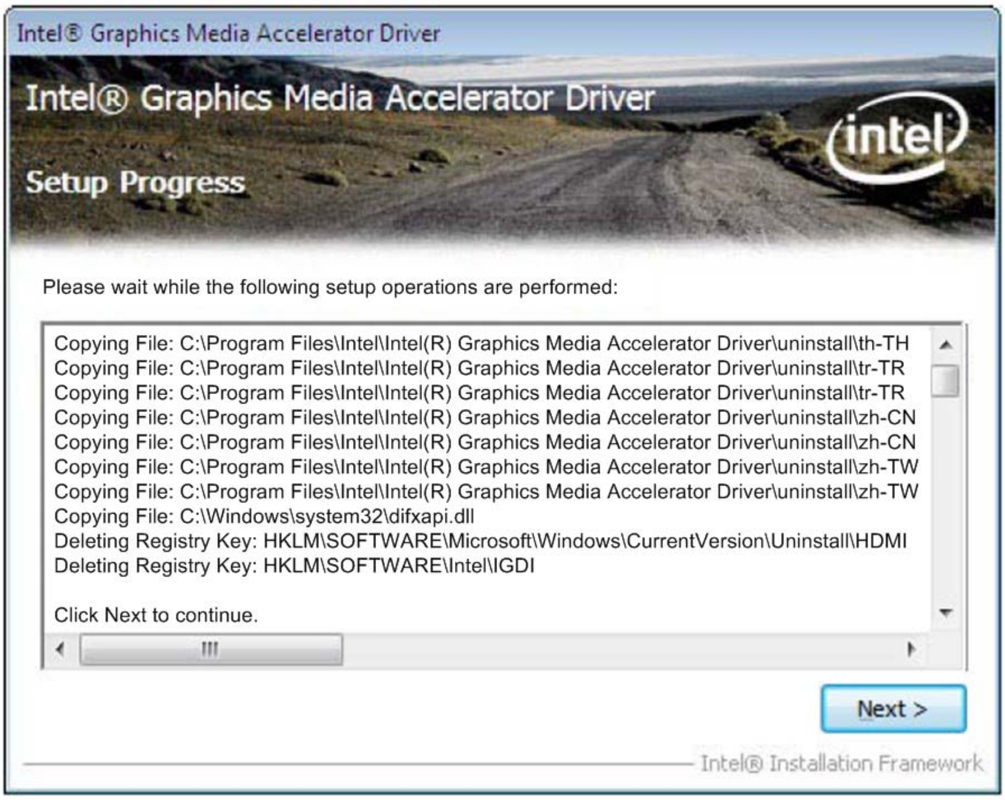
3. A Readme File Information screen appears to show you the system requirements and installation information. Click "Next" to next step.



4. Please wait while setup processes the following operations.



5. When the following screen appears, please click “Next”.



6. You are suggested to select “Yes, I want to restart this computer now”. Click “Finish” to complete the setup process and reboot.



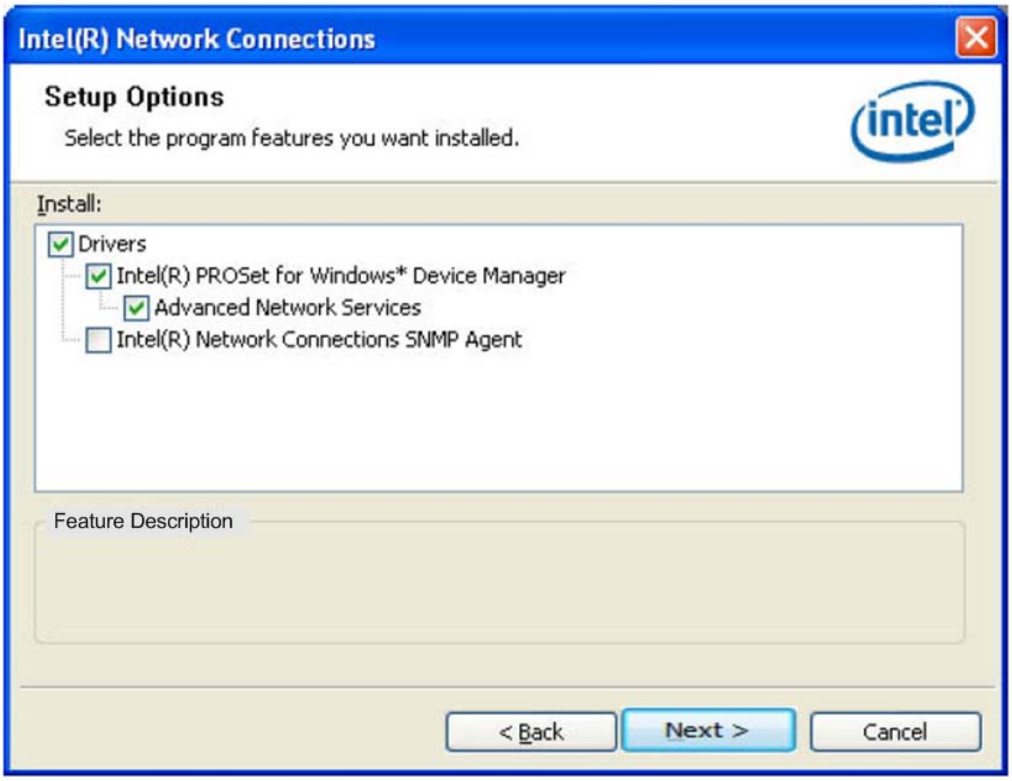
<u>Note</u>*: *After the computer reboots, the display is in extended mode. Please click hot key <Ctrl+Alt+F1> to switch display back to single mode.

5.3 Installing Ethernet Driver

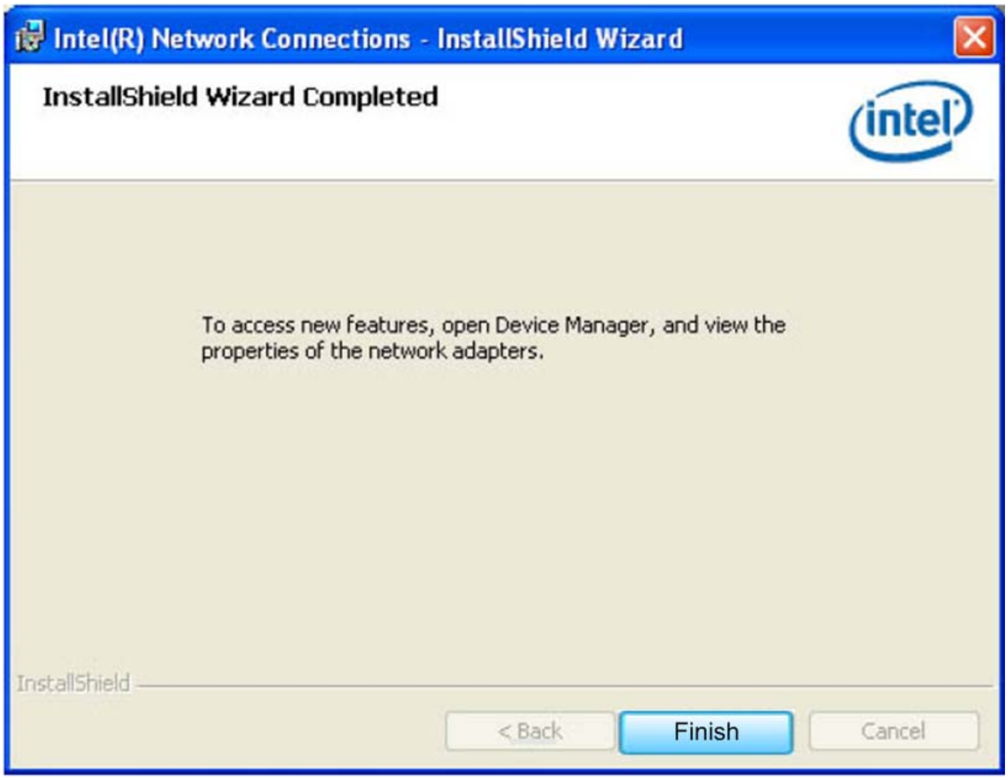
1. Unzip PROWin32 for ethernet driver from the driver directory in product information CD. Click “Next” to start the installation.



2. When the following screen appears, please select the program features you want to install. Click "Next" to continue.

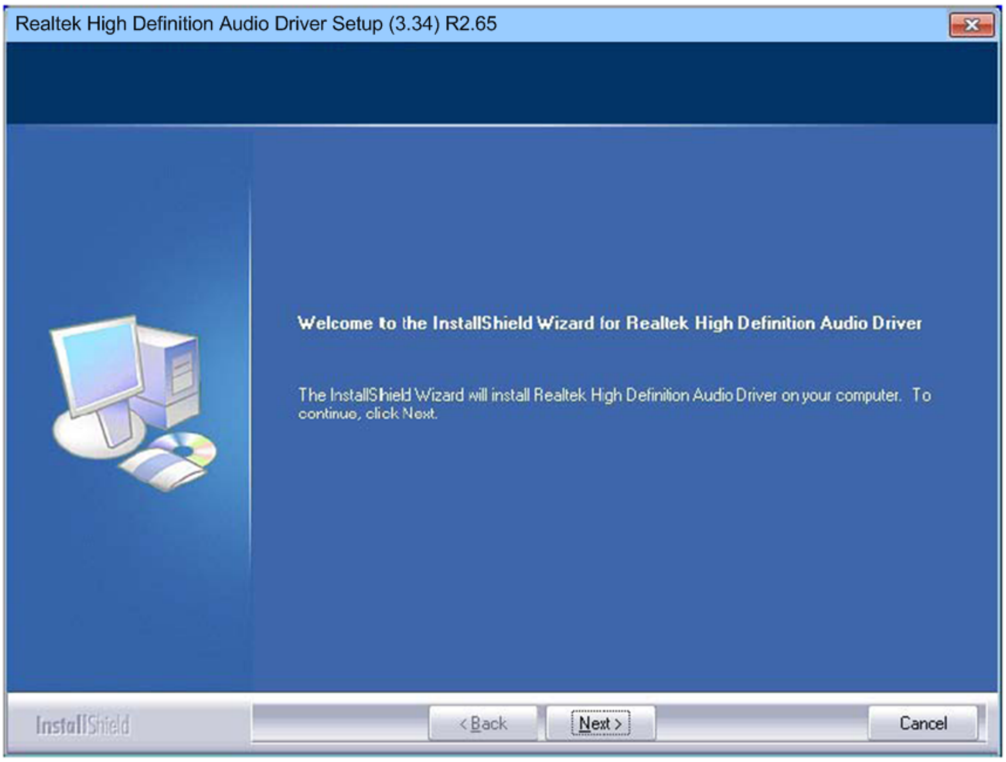


3. Click "Finish" to complete the installation.

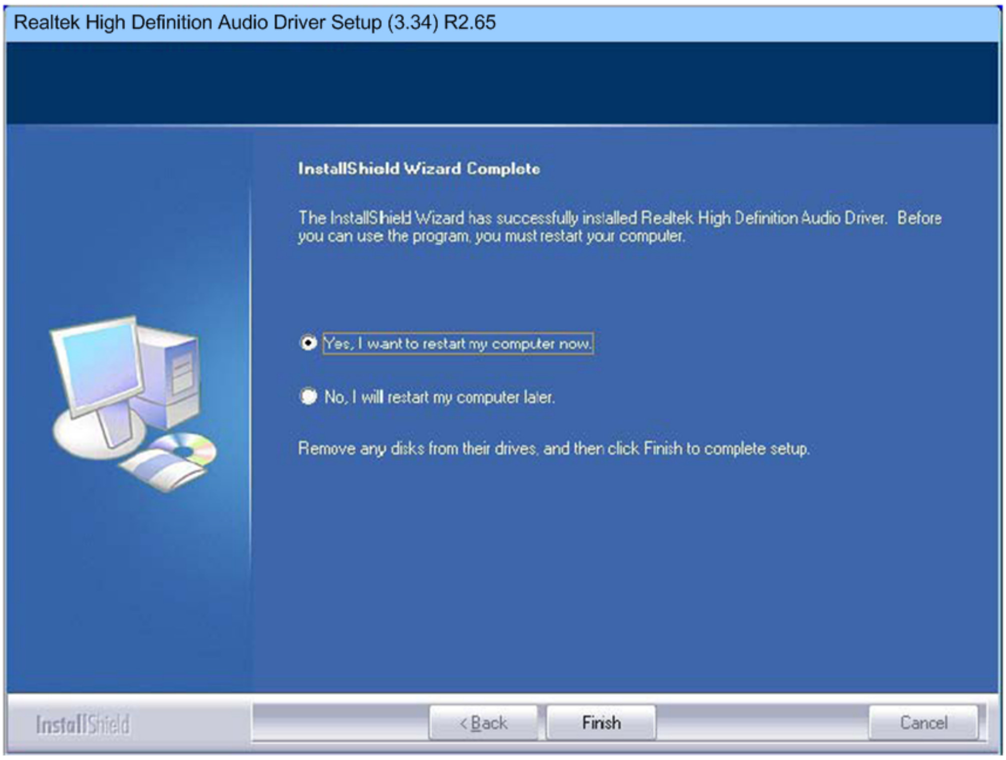


5.4 Installing Audio Driver

1. Run the setup.exe for audio from the driver directory in product information CD. Click "Next" to continue.



2. You are suggested to select “Yes, I want to restart my computer now”. Click “Finish” to complete the setup process and reboot.



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Appendix A
Watchdog Timer

About Watchdog Timer

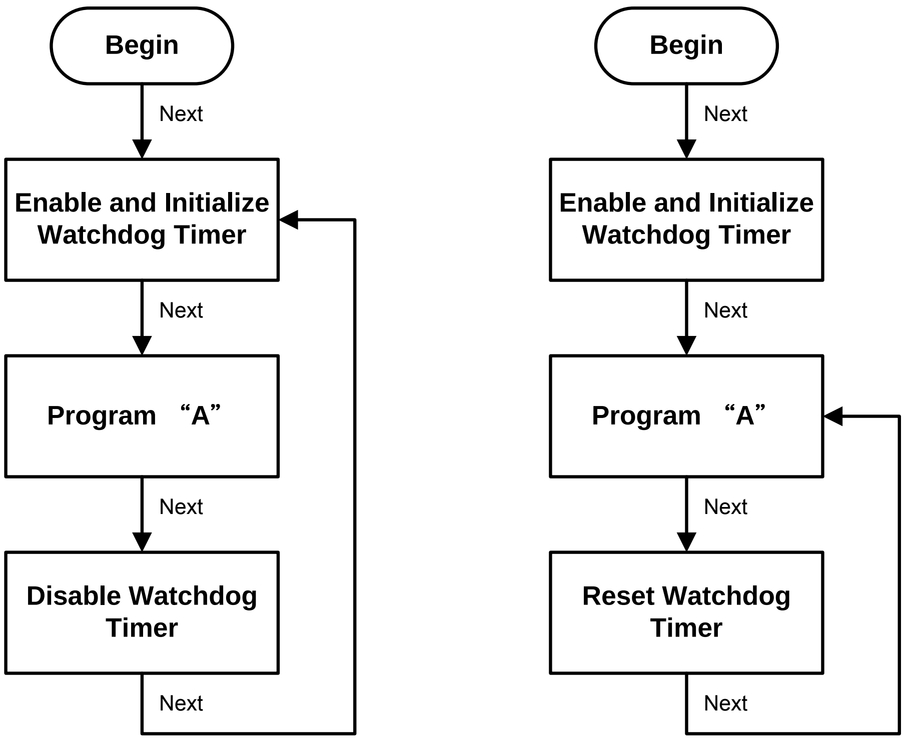
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

How to Use Watchdog Timer

The I/O port base addresses of watchdog timer are 2E (hex) and 2F (hex). The 2E (hex) and 2F (hex) are address and data port respectively.

Assume that program A is put in a loop that must execute at least once every 10ms. Initialize watchdog timer with a value bigger than 10ms. If the software has no problems; watchdog timer will never expire because software will always restart the counter before it reaches zero.



Sample Program

Assembly sample code :

```
;Enable WDT:
mov     dx,2Eh
mov     al,87            ;Un-lock super I/O
out     dx,al
out     dx,al

;Select Logic device:
mov     dx,2Eh
mov     al,07h
out     dx,al
mov     dx,2Fh
mov     al,08h
out     dx,al

;Activate WDT:
mov     dx,2Eh
mov     al,30h
out     dx,al
mov     dx,2Fh
mov     al,01h
out     dx,al

;Set Second or Minute :
mov     dx,2Eh
mov     al,0F5h
out     dx,al
mov     dx,2Fh
mov     al,Nh           ;N=00h or 08h(see below Note)
out     dx,al

;Set base timer :
mov     dx,2Eh
mov     al,0F6h
out     dx,al
mov     dx,2Fh
mov     al,Mh           ;M=00h,01h,...FFh (hex),Value=0 to 255
out     dx,al           ;(see below Note)

;Disable WDT:
mov     dx,2Eh
mov     al,30h
out     dx,al
mov     dx,2Fh
mov     al,00h          ;Can be disabled at any time
out     dx,al
```

***Note**:*

*If **N**=00h, the time base is set to second.*
***M** = time value*

00: Time-out Disable
01: Time-out occurs after 1 second
02: Time-out occurs after 2 seconds
03: Time-out occurs after 3 seconds
.
.
FFh: Time-out occurs after 255 seconds

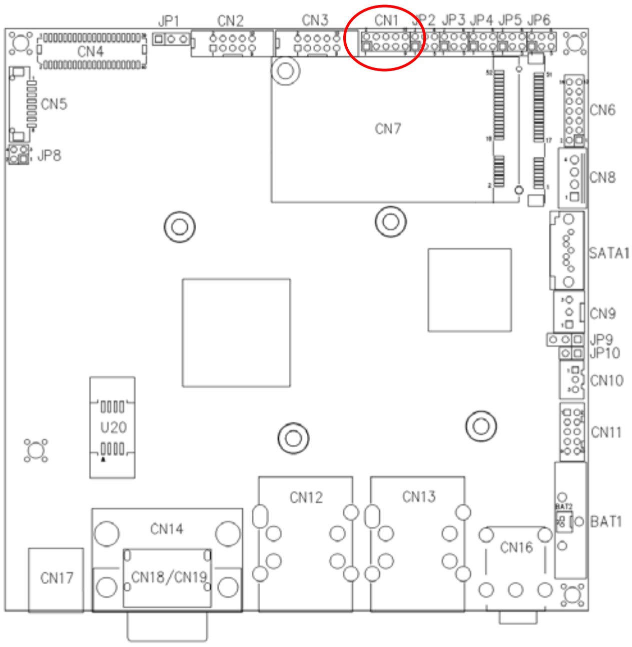
*If **N**=08h, the time base is set to minute.*
***M** = time value*
00: Time-out Disable
01: Time-out occurs after 1 minute
02: Time-out occurs after 2 minutes
03: Time-out occurs after 3 minutes
.
.
FFh: Time-out occurs after 255 minutes

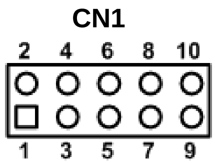
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Appendix B
Digital I/O

About Digital I/O

The onboard digital I/O has 8 bits (DI0~2 and DO0~4). Each bit can be set to function as input or output by software programming. In default, all pins are pulled high with +5V level (according to main power).





Pin	Signal	Pin	Signal
1	DI0	2	DO0
3	DI1	4	DO1
5	DI2	6	DO2
7	GND	8	DO3
9	GND	10	DO4

Digital I/O Programming

Assembly sample code :

Set functionality:

```
;Start set DIO program:

mov     dx,2Eh          ;Un-lock super I/O
mov     al,87h
out     dx,al
out     dx,al

mov     dx,2Eh          ;Switch to DIO logic device
mov     al,07h
out     dx,al
mov     dx,2Fh
mov     al,08h
out     dx,al

mov     dx,2Eh          ;Enable DI and DO port
mov     al,30h
out     dx,al
mov     dx,2Fh
```

```
mov     al,06h
out     dx,al

;Programming DI port  as input.
mov     dx,2Eh
mov     al,0E0h
out     dx,al
mov     dx,2Fh
mov     al,Nh            ;If N=E0h, DI is programmed as 3 inputs
out     dx,al            ;(see below Note1)

;Read digital input data.
mov     dx,2Eh
mov     al,0E1h
out     dx,al
mov     dx,2Fh
in      dx,al            ;bit5~7 are onboard digital I/O connector pin
                         ;0~2 state (1 High, 0 Low) (see below Note2)

;Programming DO port  as output.
mov     dx,2Eh
mov     al,0E4h
out     dx,al
mov     dx,2Fh
mov     al,Xh            ;If X=00h, DO is programmed as 5 outputs
out     dx,al            ;(see below Note3)

; Set digital output pins value.
mov     dx,2Eh
mov     al,0E5h
out     dx,al
mov     dx,2Fh
mov     al,Yh            ;set output value Y
out     dx,al            ;bit0~4 are onboard digital I/O connector pin
                         ;0~4 state (1 High, 0 Low)
                         ;(see below Note4)
```

Note1:

*The **N** has 8 bits. Only bits 5,6,7 are programmable.*
" 1" means that the bit is programmed to input.
" 0" means that the bit is programmed to output.

Ex:
***N**=E0h=11100000b*

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
DI2 as input	DI1 as input	DI0 as input	No use	No use	No use	No use	No use

Note2:

1. *When DI0~2 are connected to external device, the device sets DI0~2 to high*

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
DI2 = 1	**DI1 = 1**	**DI0 = 1**	No use	No use	No use	No use	No use

2. *When DI0~2 are connected to external device, the device sets DI0 to low and DI1~2 to high*

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
DI2 = 1	**DI1 = 1**	**DI0 = 0**	No use	No use	No use	No use	No use

Note3:

*The **X** has 8 bits. Only bits 0,1,2,3,4 are programmable.*
" 1" means that the bit is programmed to input.
" 0" means that the bit is programmed to output.

Ex:
***X**=00h=00000000b*

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
No use	No use	No use	DO4 as output	DO3 as output	DO2 as output	DO1 as output	DO0 as output

Note4:

1. *When **Y**=15h*

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
No use	No use	No use	1	0	1	0	1

2. *When **Y**=07h*

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
No use	No use	No use	0	0	1	1	1